

# ŠKODA

## Workshop Manual

Octavia II 2004 ➤ , Octavia II 2010 ➤ ,  
Superb II 2008 ➤ , Superb II 2011 ➤ ,  
Yeti 2010 ➤ , Yeti 2011 ➤

**2.0/103; 125 kW TDI CR Engine (1st generation)**

Engine ID	CBB B	CBD B	CEG A						
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Edition 05.2017

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Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.



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## 00 – Technical data

### 1 Identification

(SRL001090; Edition 05.2017)

⇒ [“1.1 Engine number”, page 1](#)

⇒ [“1.2 Engine characteristics”, page 1](#)

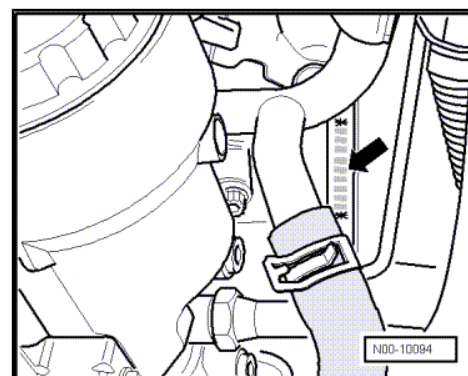
#### 1.1 Engine number

The engine number (“engine identification characters” and “serial number”) is located in the front at the engine/gearbox joint -arrow-.

In addition, a sticker with the “engine identification characters” and “serial number” is affixed to the toothed belt guard.

The engine identification characters are also on the vehicle data sticker.

- ◆ Starting with the letter “C”, new four digit engine codes have been introduced.
- ◆ The first 3 digits of the engine identification characters refer to the displacement and the mechanical construction of the engine. They are type-punched on the cylinder block including the serial number.
- ◆ The 4th digit refers to the output and torque of the engine and depends upon the engine control unit.



#### 1.2 Engine characteristics

Engine codes		CBBB	CBDB	CEGA
Manufactured	Superb II	08.2008 ➤ 05.2010	---	---
	Octavia II	---	---	06.2008 ➤ 02.2013
	Yeti	---	05.2009 ➤ 11.2009	10.2009 ➤ 05.2010
Emission standards conforming to		EU5	EU5	EU5
Displacement		1.968	1.968	1.968
Output kW at rpm		125/4200	103/4200	125/4200
Torque Nm at rpm		350/1750...2500	320/1750...2500	350/1750...2500
Bore Ø mm		81.0	81.0	81.0
Stroke mm		95.5	95.5	95.5
Number of cylinders/valves per cylinder		4/4	4/4	4/4
Compression ratio		16.5:1	16.5:1	16.5:1
Firing order		1-3-4-2	1-3-4-2	1-3-4-2
Catalytic converter		yes	yes	yes
Exhaust gas recirculation with radiator		yes	yes	yes
Turbocharging		yes	yes	yes
Charge air cooler		yes	yes	yes
Diesel particle filter		yes	yes	yes
Balancing shaft module		yes	no	no



## 2 Self diagnosis, safety measures, cleanliness regulations and directions

⇒ [“2.1 Self-diagnosis”, page 2](#)

⇒ [“2.2 Supplementary instructions and assembly work on vehicles with an air conditioning system”, page 2](#)

⇒ [“2.3 Safety precautions when working on fuel supply system”, page 3](#)

⇒ [“2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system”, page 4](#)

⇒ [“2.5 Regulations concerning cleanliness when working on the exhaust gas turbocharger”, page 5](#)

⇒ [“2.6 General instructions for charge air system”, page 5](#)

### 2.1 Self-diagnosis

This Rep.-Gr. is deleted.

For this use the “Vehicle self-diagnosis”, “Measuring method” and “Fault finding” ⇒ Vehicle diagnostic tester.

### 2.2 Supplementary instructions and assembly work on vehicles with an air conditioning system



#### WARNING

*Do not open the refrigerant circuit of the air conditioning system.*



#### Note

*To prevent damage to condenser or to refrigerant lines/hoses, ensure that the lines and hoses are not stretched, kinked or bent.*

Steps which should be taken in order to remove and install the engine without opening the refrigerant circuit:

- Unscrew the holding clamp(s) on the refrigerant lines.
- Remove V-ribbed belt  
⇒ [“1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system”, page 45](#) .
- Remove AC compressor from the bracket for auxiliary units  
⇒ [“1.2 Summary of components - V-ribbed belt drive for vehicles with air conditioning system”, page 43](#) .
- Mount the air conditioning compressor and the condenser in such a way that the refrigerant lines/hoses are not under tension.



## 2.3 Safety precautions when working on fuel supply system



### WARNING

*When undertaking all assembly work, particularly in the engine compartment due to its cramped construction, please observe the following:*

- ◆ *Install lines of all kinds so that the original routing can be restored.*
- ◆ *Ensure that there is adequate free access to all moving or hot components.*
- ◆ *The fuel or the fuel lines in the fuel system can become very hot (risk of scalding)!*
- ◆ *The fuel system is under pressure!*
- ◆ *Wear safety goggles and safety clothing, in order to avoid injuries and skin contact with fuel.*
- ◆ *Place cleaning cloths around the connection point before detaching cable connections. Reduce pressure by carefully removing the wiring.*

*For reasons of safety, the power supply to the fuel pump must be interrupted before the fuel system is opened. The fuel pump would otherwise be activated when the driver's door is opened. One of the following options must be used to interrupt the current supply:*

- ◆ *Disconnect battery*

*or*

- ◆ *Take out fuse for fuel pump relay - J17-*

*or*

- ◆ *Pull connector off fuel delivery unit flange.*



### Caution

*In order to avoid the high pressure pump to run dry and to achieve a quick engine start after parts are replaced, the following points must be observed:*

- ◆ *If parts of the fuel system were removed or replaced, it is necessary to initiate the basic setting "check fuel pump" in order to vent the fuel system ⇒ Vehicle diagnostic tester.*
- ◆ *If the fuel pump, fuel line or fuel filter were removed or replaced, the basic setting "check fuel pump must be initiated" »once« before the first engine start.*
- ◆ *If the fuel pump was removed, the basic setting "test of fuel pump" must be initiated »3 times« before the first engine start.*
- ◆ *If the high pressure pump was replaced, the high pressure-pump must be filled with fuel before the first engine start*  
*⇒ "2.9 Fill the high pressure pump with fuel and discharge the fuel system", page 290 .*



**When removing and installing the fuel gauge transmitter or the fuel delivery unit from a full or partly filled fuel tank, pay attention to the following points:**

- ◆ The extraction hose of an exhaust extraction system which is switched on, must be positioned close to the assembly opening of the fuel tank in order to extract the released fuel vapours, even before the work is commenced. If no exhaust extraction system is available, a radial fan (motor not in air flow of fan) with a delivery volume of more than 15 m<sup>3</sup>/h must be used.
- ◆ Prevent skin contact with fuel! Wear fuel-resistant gloves!

**If test and measuring devices are required during test drives observe the following:**

- ◆ Always secure the test and measuring devices on the rear seat and have a second person operate them there.

If the test and measuring devices are operated from the passenger seat, the passenger could be injured by the release of the passenger airbag in the event of an accident.

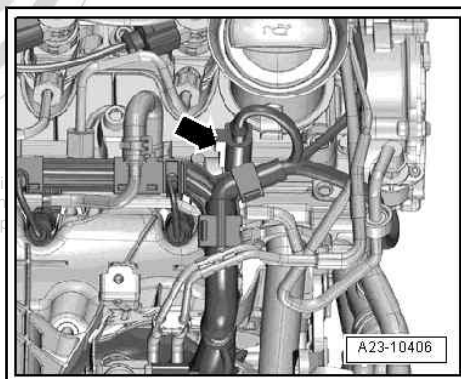


#### WARNING

***Secure the diagnostic device to the rear seat and operate from that position.***

**Observe the following points to prevent injury to persons and/or damage to the injection and preheating system:**

- ◆ People, who have a heart pacemaker implant, should not bend over the engine compartment when the engine is running, as the injection units generate an output high voltage pulse.
- ◆ No fuel lines must be opened when the engine is running.
- ◆ Disconnect and connect wires of the preheating and injection system as well as measuring device wires when the ignition is switched off.
- ◆ Do not carry out engine wash unless the ignition is switched off.
- ◆ If the engine must be operated, without it starting, unplug the connector -arrow- at the fuel pressure regulating valve - N276- .
- ◆ Switch off the ignition before disconnecting and connecting the battery, as this may damage the engine control unit.
- ◆ After connecting the battery, carry out certain additional operations → Electrical System; Rep. gr. 27 .



## 2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system

Carefully observe the following "rules" for cleanliness when working on the fuel supply/injection system:

- ◆ Thoroughly clean the connection points and their surroundings before releasing.
- ◆ Place removed parts on a clean surface and cover. Use lint-free cloths.
- ◆ Carefully cover or close opened components if the repair is not completed immediately.

- ◆ Only install clean parts: remove spare parts from their wrapping immediately before fitting. Do not use any parts which have been stored unwrapped (e.g. on a shelf or in a tool box).
- ◆ When the system is opened: Avoid using compressed air. Avoid moving the vehicle.
- ◆ Also make sure no diesel fuel runs onto the coolant hoses. If this is the case clean the hoses immediately. Replace immediately any hoses which have suffered damage.

## 2.5 Regulations concerning cleanliness when working on the exhaust gas turbocharger

Carefully observe the following "rules" for cleanliness when working on the exhaust gas turbocharger:

- ◆ Thoroughly clean the connection points and their surroundings before releasing.
- ◆ Place removed parts on a clean surface and cover. Use lint-free cloths.
- ◆ Carefully cover or close opened components if the repair is not completed immediately.
- ◆ Only install clean parts: remove spare parts from their wrapping immediately before fitting. Do not use any parts which have been stored unwrapped (e.g. on a shelf or in a tool box).
- ◆ When the system is opened: Avoid using compressed air. Avoid moving the vehicle.

## 2.6 General instructions for charge air system



### WARNING

*When undertaking all installation work, particularly in the engine compartment because of its cramped construction, please observe the following:*

- ◆ *Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.*
- ◆ *Ensure that there is adequate free access to all moving or hot components.*



### Caution

*In case a mechanical damage to the exhaust gas turbocharger is found, e.g. damage to the compressor wheel, it is not sufficient to only replace the turbocharger. In order to avoid consequential damage, the following tasks must be performed:*

- ◆ *Clean all oil lines.*
- ◆ *Change engine oil and oil filter.*
- ◆ *Check air filter housing, air filter element and charge air pipes as well as charge air hoses for soiling.*
- ◆ *Check all the air guides and the charge air cooler for foreign bodies.*

*If foreign bodies are detected in the charge air system, the complete charge-air routing must be cleaned and if necessary the charge air cooler must also be replaced.*

- ◆ The charge-air system must be tight, check  
⇒ ["2.7 Checking the charge-air system for leaktightness", page 262](#) .
- ◆ Replace the gaskets, the sealing rings and the self-locking nuts.
- ◆ Hose connections and hoses for the charge air system must be free of oil and grease before being installed. The gasket ring and the sealing surface must be slightly oiled only for push-fit couplings ⇒ ["2.6 Hose connections", page 261](#) .
- ◆ Observe markings on the hoses and components.
- ◆ All hose connections of the charge air system are secured with spring strap clamps or push-fit couplings.
- ◆ Only install approved clamps for securing the hose connections ⇒ ETKA - Electronic Catalogue of Original Parts .
- ◆ Spring-type clip pliers are recommended for installation of spring-type clips.
- ◆ Assembly of hose connections with push-fit couplings  
⇒ ["2.6 Hose connections", page 261](#) .
- ◆ Before screwing down the oil feed line, fill the exhaust turbocharger via the connection fitting with engine oil.
- ◆ To ensure the oil supply to the exhaust gas turbocharger, leave the engine running for about 1 minute after installing the exhaust gas turbocharger.

## 10 – Removing and installing engine

### 1 Removing and installing engine

- ⇒ [“1.1 Removing and installing engine trim panel”, page 7](#)
- ⇒ [“1.2 Remove engine \(Octavia II, Yeti\)”, page 8](#)
- ⇒ [“1.3 Remove engine Superb II”, page 16](#)
- ⇒ [“1.4 Securing the engine to the assembly stand”, page 24](#)
- ⇒ [“1.5 Installing engine”, page 25](#)
- ⇒ [“1.6 Assembly overview - assembly mountings”, page 29](#)
- ⇒ [“1.7 Checking and adjusting the assembly mounting, Octavia II, Yeti”, page 31](#)
- ⇒ [“1.8 Checking and adjusting the assembly bracket Superb II”, page 32](#)
- ⇒ [“1.9 Removing and installing engine support”, page 35](#)

#### 1.1 Removing and installing engine trim panel

##### Removing



##### Caution

*The brackets of the engine cover on the cylinder head cover can break off when they are incorrectly removed.*

- ◆ *It is therefore necessary to remove the engine cover according to the following instruction.*

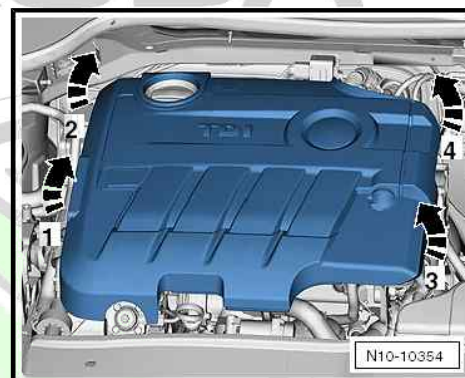
- Successively slacken the engine cover in the marked sequence -1 ... 4- from the fixing points. To do so, grip the engine cover from underneath as far as possible in the area of the -arrows- and pull it upwards out of the attachment.

##### Installing



##### Caution

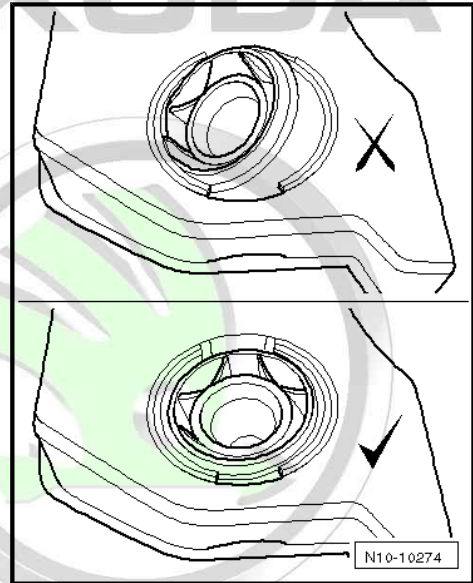
*Before installing the engine cover, check the correct fitting position of the 4 fixing elements (ball sockets), if necessary move them into the correct position. Otherwise this can lead to damage to the engine cover.*







- If necessary, press the ball sockets of the engine cover into the correct position.
- Position the engine cover onto the fixing points and press it in at the corners until it clicks into place.



## 1.2 Remove engine (Octavia II, Yeti)

### Special tools and workshop equipment required

- ♦ Removal tool for inner lining of the door panel - MP8-602/1-
- ♦ Engine mount - T10012-
- ♦ Engine/gearbox jack , e.g. -V.A.G 1383 A-
- ♦ Catch pan , e.g. -VAS 6208-
- ♦ Double ladder , e.g. -VAS 5085-
- ♦ Pliers for spring-type clips



### Note

- ♦ *The engine is removed downwards together with the gearbox.*
- ♦ *All cable straps that have been loosened or cut open when the engine was removed must be attached again in the same location when the engine is installed again.*
- ♦ *Leave the ignition key in the ignition lock so that the steering lock does not click into place.*
- ♦ *Collect drained coolant in a clean container for proper disposal or reuse.*



### Caution

**When undertaking all installation work, particularly in the engine compartment because of its cramped construction, please observe the following:**

- ♦ **Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.**
- ♦ **Ensure that there is adequate free access to all moving or hot components.**

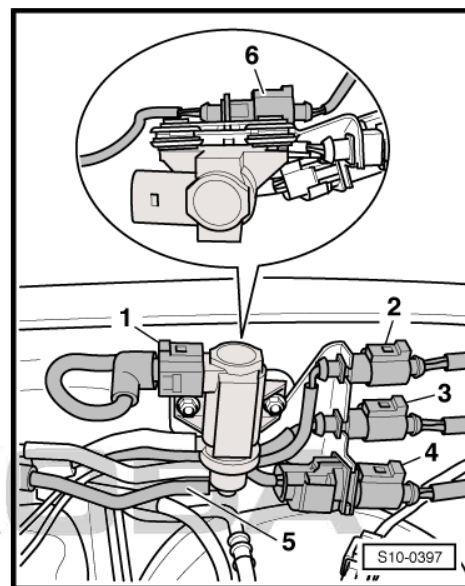
Observe all safety measures and notes for assembly work on the fuel supply and injection system, at the charge air system and



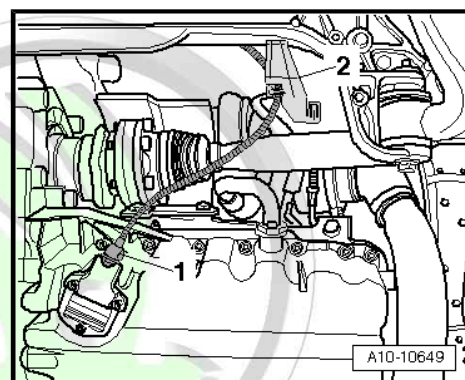
observe as well the rules for cleanliness

⇒ ["2 Self diagnosis, safety measures, cleanliness regulations and directions", page 2](#) .

- If present, take the adapter for the anti-theft wheel bolts out of the luggage compartment.
- Disconnect the battery-earth strap with the ignition off ⇒ Electrical System; Rep. gr. 27 .
- Remove engine cover  
⇒ ["1.1 Removing and installing engine trim panel", page 7](#) .
- Remove air filter, air mass meter - G70- and intake hose  
⇒ ["3.5 Removing and installing air filter housing", page 307](#) .
- Remove the battery with the battery tray ⇒ Electrical System; Rep. gr. 27 .
- Unplug the following plug connections at the bulkhead:
  - 2 - Exhaust gas temperature sender 4 - G648- (orange)
  - 3 - Exhaust gas temperature sender 1 - G235- ( Temperature sender upstream turbocharger - G507- ) (black)
  - 4 - Lambda probe - G39- (black)
  - 6 - Exhaust gas temperature sender 3 - G495- (brown)
- Pull off the vacuum hose -5- from the charge pressure control solenoid valve - N75- .
- Drain coolant ⇒ ["1.3 Draining and filling coolant", page 163](#) .



- Disconnect electrical plug connection -1- at the oil level and oil temperature sender - G266- .
- Remove bracket -2- for the wiring harness of the oil level and oil temperature sender - G266- from the assembly carrier.
- Unscrew left front wheel.
- Remove the right and left wheelhouse liner bottom part ⇒ Body Work; Rep. gr. 66 .
- Unscrew the left drive shaft from the flange shaft of the gearbox.
- Remove pre-exhaust pipe with diesel particle filter  
⇒ ["1.7 Removing and installing pre-exhaust pipe with diesel particle filter", page 321](#) .



#### Vehicles with four-wheel drive

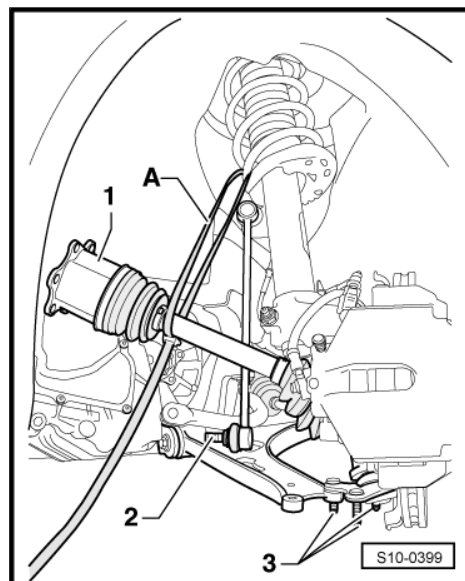
- Unscrew propshaft from angle gearbox ⇒ Gearbox; Rep. gr. 39 .

#### Continued for all vehicles

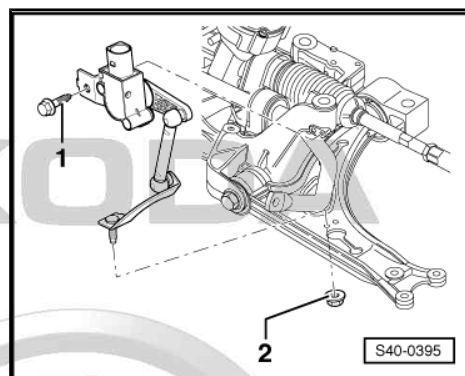
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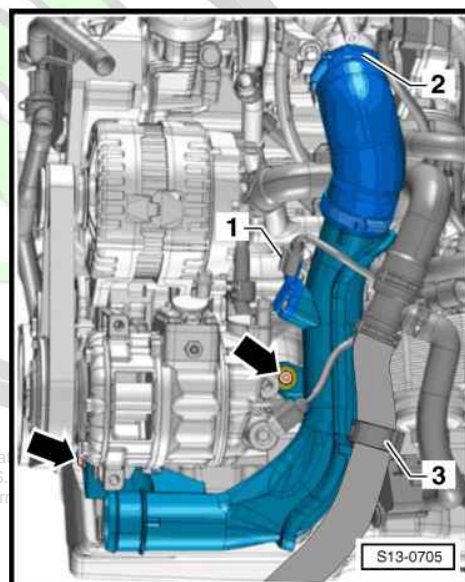
- Unscrew the nut from the left coupling rod -2- and press off the coupling rod from the anti-roll bar.
- Unscrew the nuts for the left steering joint -3- and press the steering joint out of the suspension arm.



- Unscrew the nut -2- from the front left track control arm on installed front left vehicle level sensor - G78- .
- Turn steering to full left lock.
- Swivel the steering joint outwards and secure the drive shaft -1- with a band -A- in the wheelhouse.
- Insert a pin screw in the suspension arm in order to stabilize the steering joint.
- Remove radiator  
⇒ [“4.3 Removing and installing radiator”, page 189](#) .

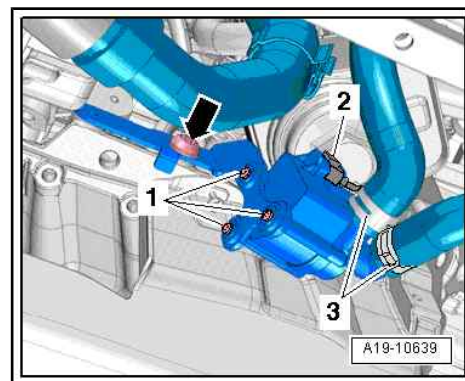


- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Loosen hose clamp -2-.
- Disconnect plug -1- at the charge pressure sender - G31- and remove the right charge air pipe.

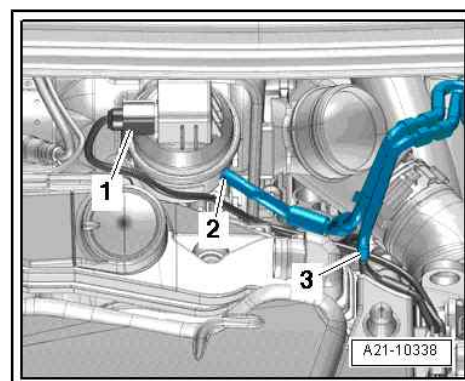


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- Unscrew screw -arrow- and push the coolant recirculation pump 2 - V178- to the side.

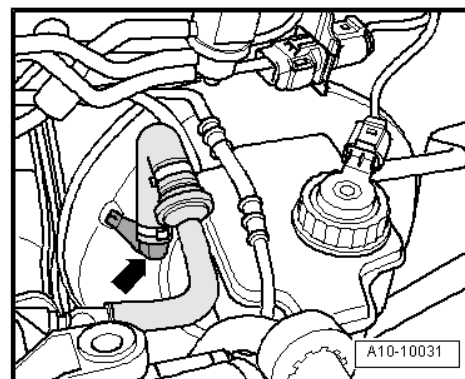
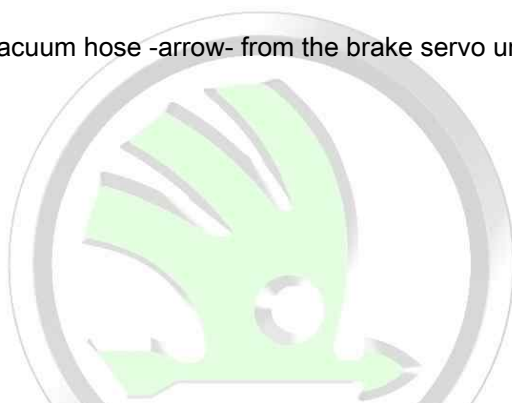


- Remove vacuum hose -2- from vacuum setting element of exhaust turbocharger.
- Disconnect vacuum hose -3-.

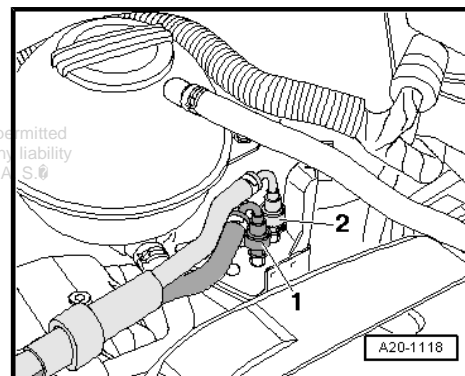


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- Remove the vacuum hose -arrow- from the brake servo unit.



- Separate fuel feed line -2- and fuel return-flow line -1-, to do so press in securing rings. Unlock the quick coupling and disconnect ➔ [“2.9 Separating push-on couplings”, page 216](#) .

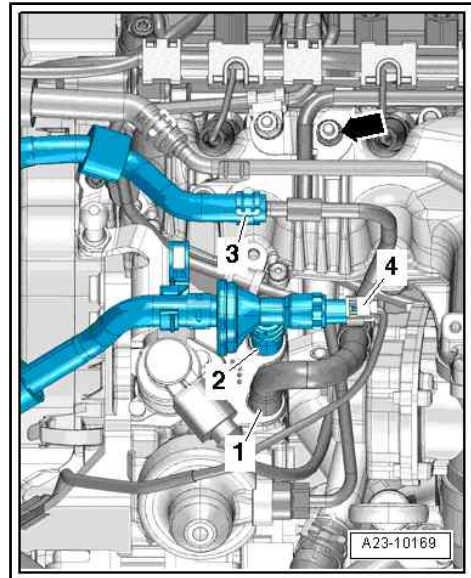


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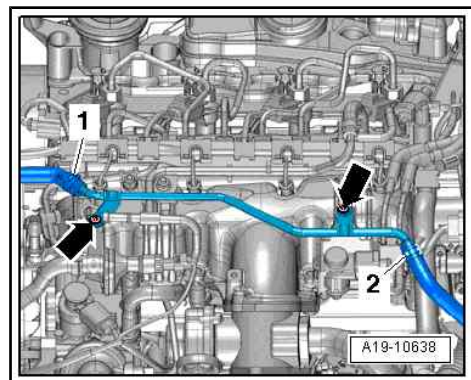


- Disconnect the plug connection -4- at the differential pressure transmitter - G81- .
- Remove fuel feed line as well as fuel return-flow line, to do so loosen hose clamps -2- and -3-.



- Remove the coolant hose to the expansion reservoir, to do so slacken the hose clamp -1-.
- Detach the bottom coolant hose from the coolant expansion reservoir.

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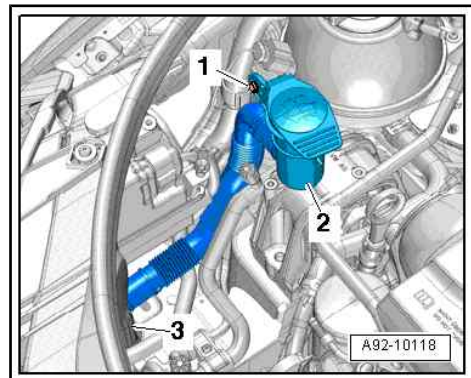


- Unscrew bolt -1-.
- Push the filler tube with the filler neck -2- for the washer-fluid reservoir to the side.

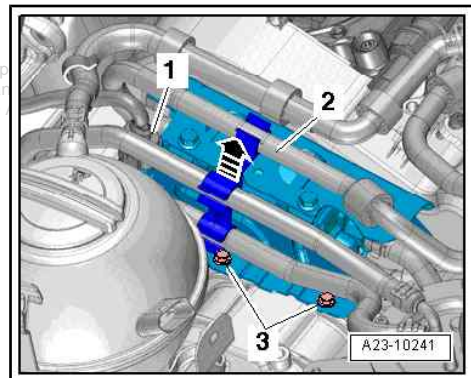


**Note**

*For reasons of clarity the fuel filter is not shown.*



- Unhook the fuel hose -2- from the bracket.
- Remove the bracket for the fuel lines upwards in -direction of arrow- and place it to the side.
- Disconnect plug -1- from the additional fuel pump - V393- .
- Unscrew screws -3-.



- Release screw -1- by two turns.
- Release screw -2- and nut -3-.
- Unclip bracket for coolant line at fuel filter.
- Remove the fuel filter with the hoses connected and the bracket together with the additional fuel pump - V393- .

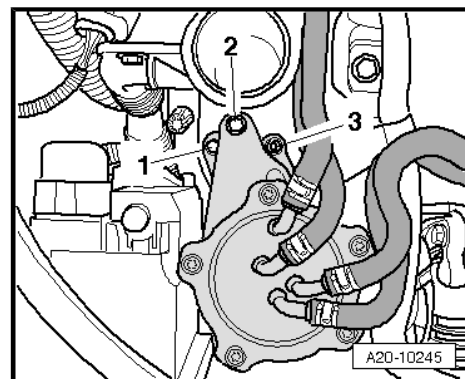
#### Vehicles with air conditioning



#### WARNING

*Risk of injury through refrigerant.*

- ◆ **Do not open the refrigerant circuit of the air conditioning system.**



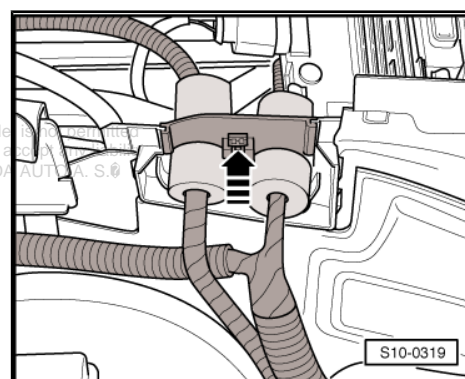
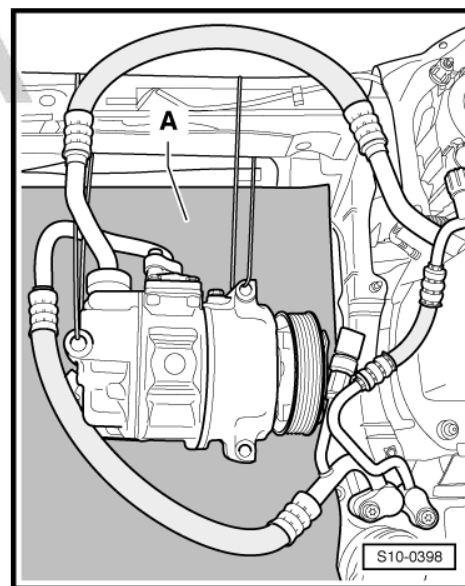
#### Note

*In order to avoid damage to the AC compressor as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.*

- Remove V-ribbed belt  
⇒ [“1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system”, page 45](#) .
- Remove the AC compressor from the bracket for auxiliary units, place a cardboard -A- underneath the charge air cooler for protection and secure the AC compressor with connected refrigerant hoses to the lock carrier.

#### Continued for all vehicles

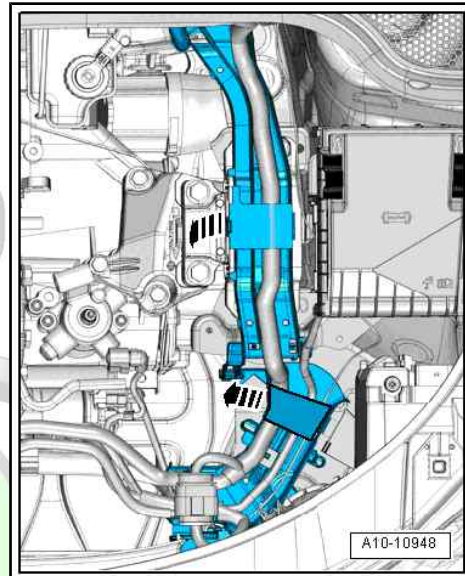
- Unlatch the fuse and disconnect the front plug from the engine control unit:
- ◆ Octavia II  
⇒ [“4.1 Removing and installing engine control unit J623 Octavia II”, page 309](#) .
- ◆ Yeti  
⇒ [“4.2 Removing and installing engine control unit J623 Superb II, Yeti”, page 310](#) .
- Release duct for engine wiring harness -arrow- and pull out upwards.



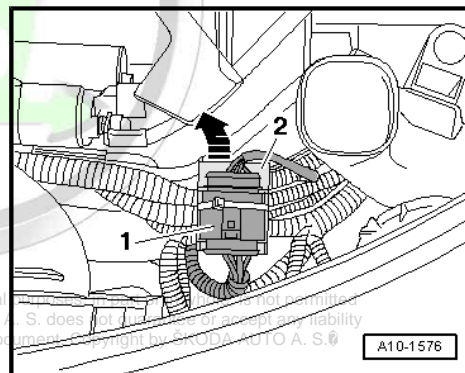
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- Open the cable guides -arrows-, remove the engine wiring harness and place down to the side.



- Expose the plug connection -1- and disconnect it.
- Open the bracket -2- lying below the cable guide.
- Remove the wiring loom to the engine control unit from the cable guide using the removal tool - MP8-602/1- and lay it on the engine.

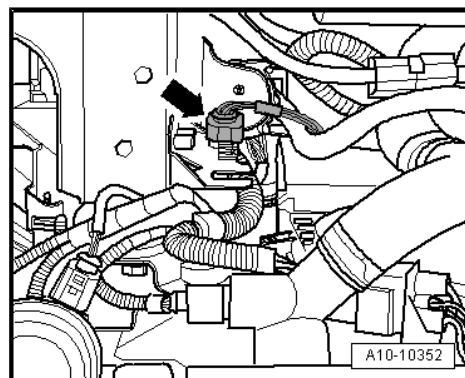


- Disconnect plug connection -arrow- at the bottom left frame side rail.

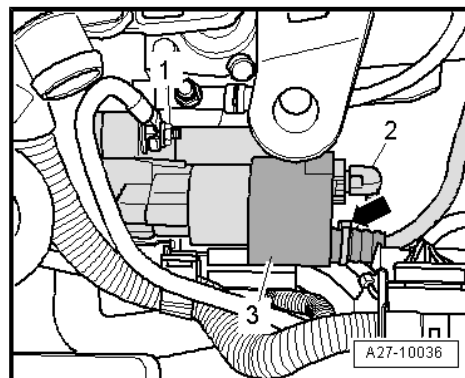


**Note**

*For purposes of presentation, the fitting position is shown from below.*



- Remove the cable strap of the -arrow- protective cover, if present.
- Unbolt earth cable -1-.
- Disconnect plug connection -2-.
- Pull back the protective cover and unscrew the cable from the solenoid switch of the starter.
- Disconnect further necessary plug connections at the engine and gearbox or line connections to engine and gearbox.





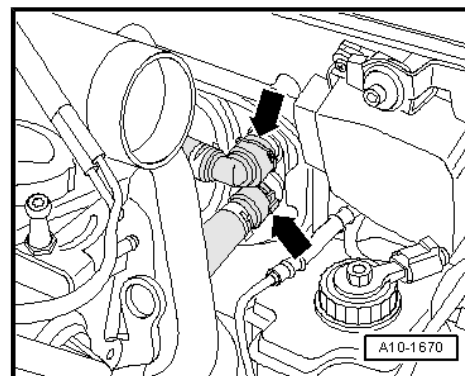
- Separate the quick couplings -arrows- at the heat exchanger.

#### Vehicles with auxiliary heating

- Place a catch pan for coolant under the auxiliary heating.
- Detach the coolant hoses of the auxiliary heating.
- Remove exhaust pipe of auxiliary heating (only for vehicles with extended exhaust pipe) ⇒ Heating, Air Conditioning ⇒ Rep. gr. 82 .

#### Continued for vehicles with manual gearbox

- Remove shift mechanism from gearbox ⇒ Gearbox; Rep. gr. 34 .
- Remove pressure line from breather/slave cylinder ⇒ Gearbox; Rep. gr. 30 .



#### WARNING

*After separating the hydraulic line, do not operate the clutch pedal.*

#### Vehicles with automatic gearbox

- Remove shift mechanism from gearbox ⇒ Gearbox; Rep. gr. 34 .

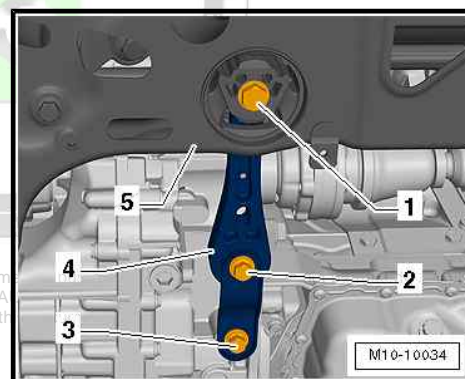
#### Continued for all vehicles

- Unclamp all remaining connecting, coolant, vacuum and suction hoses from the engine.
- Release all remaining plugs at engine and gearbox and lay aside the relevant lines.
- Undo screws -1...3- and remove the pendulum support -4-.

#### Vehicles with four-wheel drive

- Remove angle gearbox ⇒ Gearbox; Rep. gr. 34 .

#### Continued for all vehicles



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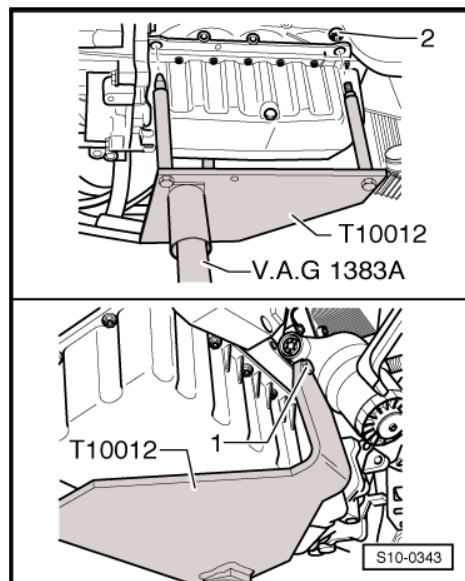


- Screw engine mount - T10012- to the cylinder block with nut -2- and screw -1- to 20 Nm.
- Insert engine/gearbox jack - V.A.G 1383 A- in the engine mount and slightly raise.

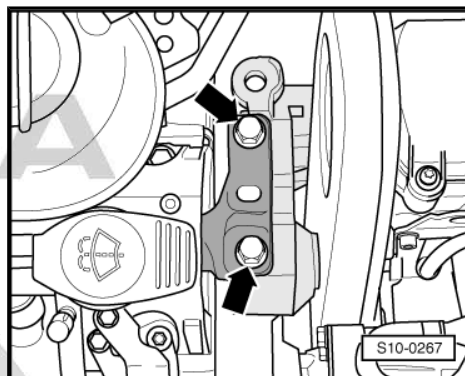


#### Note

*Use double ladder to release the screws for the engine/gearbox mounting.*



- Successively release screws for engine mounting -arrows-.



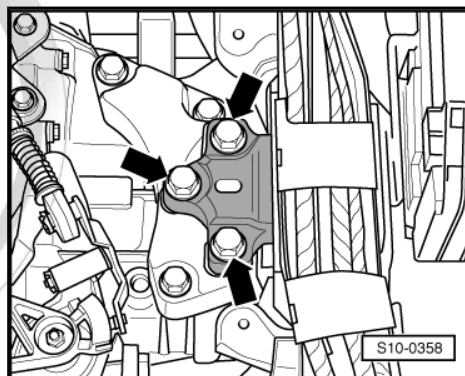
- Successively release screws for gearbox mounting -arrows-.



#### Note

- ♦ Check whether all hose and line connections between engine, gearbox and body are released.
- ♦ When lowering carefully guide the engine with the gearbox, in order to avoid damage.

- Carefully lower engine with gearbox. If necessary, turn and push engine with gearbox.
- Remove the gearbox from the engine.



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## 1.3 Remove engine Superb II

### Special tools and workshop equipment required

- ♦ Removal tool for inner lining of the door panel - MP8-602/1-
- ♦ Engine mount - T10012-
- ♦ Engine and gearbox jack , e.g. -V.A.G 1383 A-
- ♦ Catch pan , e.g. -VAS 6208-
- ♦ Double ladder , e.g. -VAS 5085-
- ♦ Pliers for spring-type clips



#### Note

- ◆ *The engine is removed downwards together with the gearbox.*
- ◆ *All cable straps that have been loosened or cut open when the engine was removed must be attached again in the same location when the engine is installed again.*
- ◆ *Collect drained coolant in a clean container for proper disposal or reuse.*



#### Caution

***When undertaking all installation work, particularly in the engine compartment due to its cramped construction, please observe the following:***

- ◆ ***Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.***
- ◆ ***Ensure that there is adequate free access to all moving or hot components.***

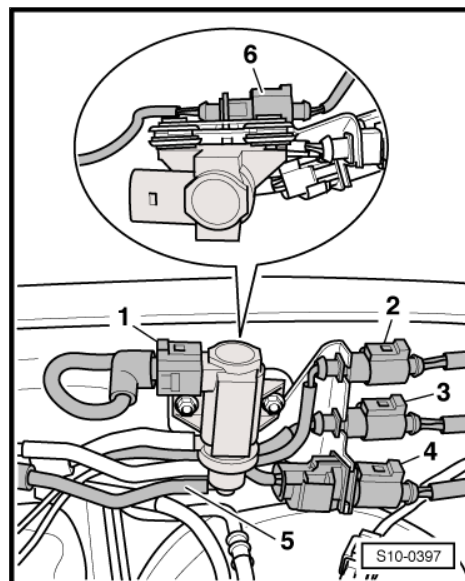
Observe all safety measures and notes for assembly work on the fuel supply and injection system, at the charge air system and observe as well the rules for cleanliness

⇒ [“2 Self diagnosis, safety measures, cleanliness regulations and directions”, page 2](#) .

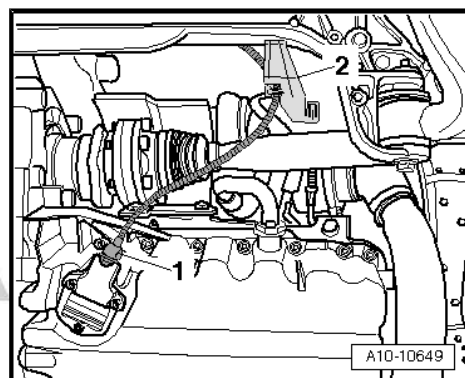
- If present, take the adapter for the anti-theft wheel bolts out of the luggage compartment.
- Disconnect the battery-earth strap with the ignition off ⇒ Electrical System; Rep. gr. 27 .
- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .
- Remove air filter housing with air mass meter - G70- and intake hose  
⇒ [“3.5 Removing and installing air filter housing”, page 307](#) .
- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .



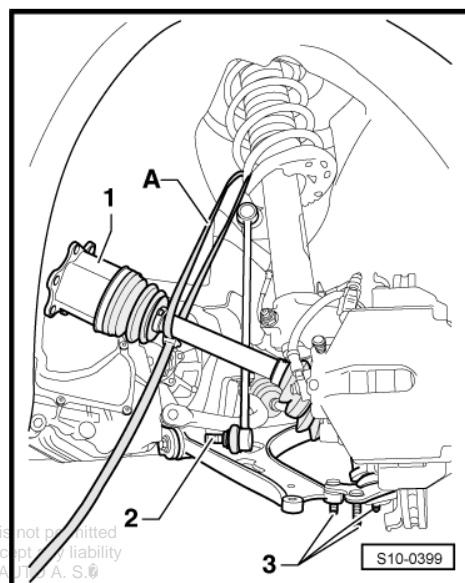
- Unplug the following plug connections at the bulkhead:
- 2 - Exhaust gas temperature sender 4 - G648-
- 3 - Exhaust gas temperature sender 1 - G235- ( Temperature sender upstream of turbocharger - G507- )
- 4 - Lambda probe - G39-
- 6 - Exhaust gas temperature sender 3 - G495-
- Pull off the vacuum hose -5- from the charge pressure control solenoid valve - N75- .
- Remove pre-exhaust pipe with diesel particle filter  
⇒ "1.7 Removing and installing pre-exhaust pipe with diesel particle filter", page 321 .



- Disconnect electrical plug connection -1- at the oil level and oil temperature sender - G266- .
- Remove bracket -2- for the wiring harness of the oil level and oil temperature sender - G266- from the assembly carrier.
- Unscrew left front wheel.
- Remove the right and left wheelhouse liner bottom part ⇒ Body Work; Rep. gr. 66 .
- Unscrew the left drive shaft from the flange shaft of the gear-box.



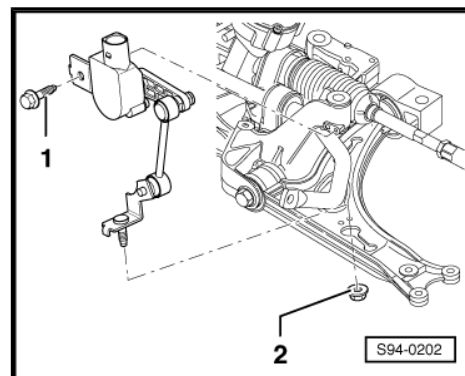
- Unscrew the nut from the left coupling rod -2- and press off the coupling rod from the anti-roll bar.
- Unscrew the nuts from the left steering joint -3- and press the steering joint out of the suspension arm.



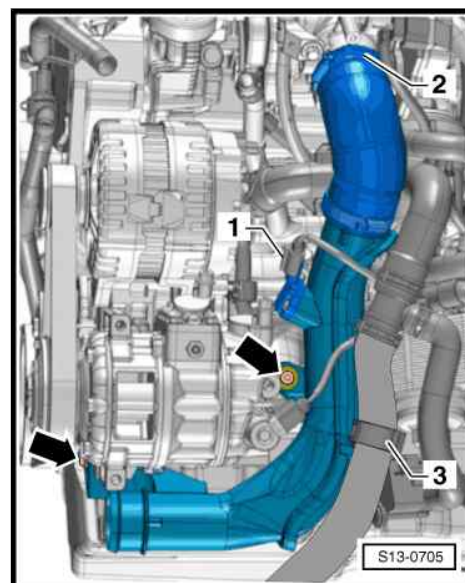
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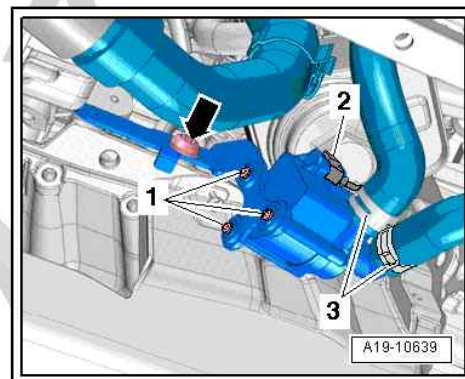
- If present, remove the front left vehicle level sensor - G78- ➔ Chassis; Rep. gr. 40 .
- Turn steering to full left lock.
- Swivel the steering joint outwards and secure the drive shaft -1- with a band -A- in the wheelhouse.
- Insert a pin screw in the suspension arm in order to stabilize the steering joint.
- Remove radiator  
⇒ ["4.3 Removing and installing radiator", page 189](#) .



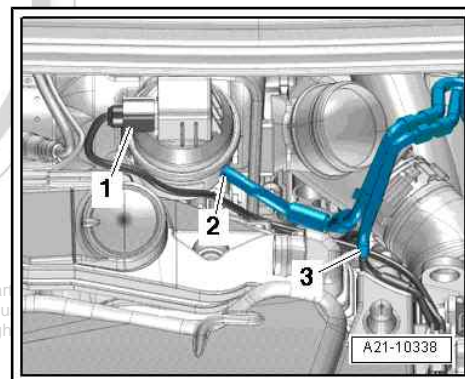
- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Loosen hose clamp -2-.
- Disconnect plug -1- at the charge pressure sender - G31- and remove the right charge air pipe.



- Unscrew screw -arrow- and push the coolant recirculation pump 2 - V178- to the side.



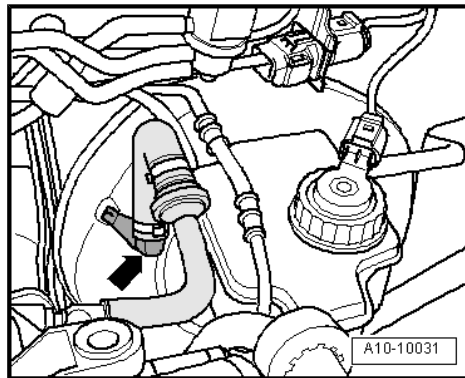
- Remove vacuum hose -2- from vacuum setting element of exhaust turbocharger.
- Disconnect vacuum hose -3-.



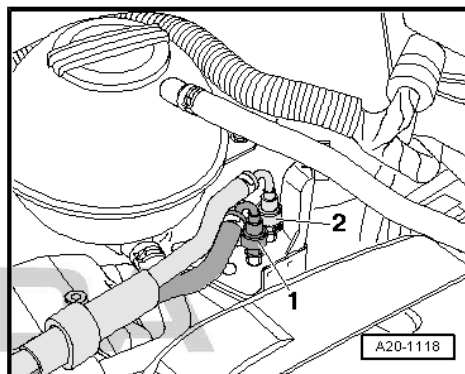
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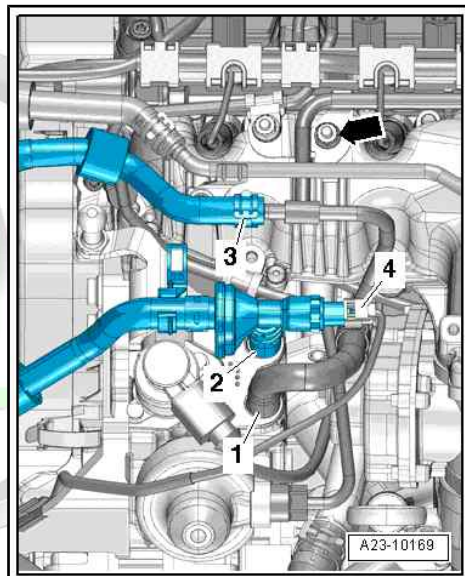
- Remove the vacuum hose -arrow- from the brake servo unit.



- Detach fuel feed line -2- and fuel return-flow line -1-, to do so press in securing ring. Unlock the quick coupling and disconnect ⇒ ["2.9 Separating push-on couplings", page 216](#) .



- Disconnect the plug connection -4- at the differential pressure transmitter - G81- .
- Remove fuel feed line as well as fuel return-flow line, to do so loosen hose clamps -2- and -3-.

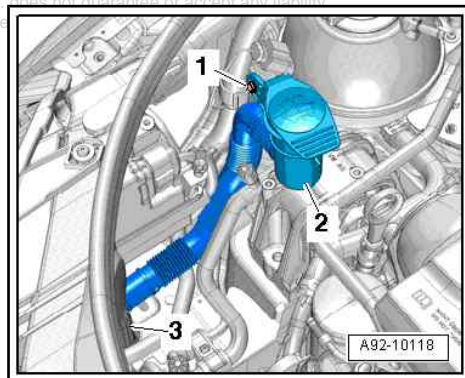


- Unscrew bolt -1-.
- Push the filler tube with the filler neck -2- for the washer-fluid reservoir to the side.



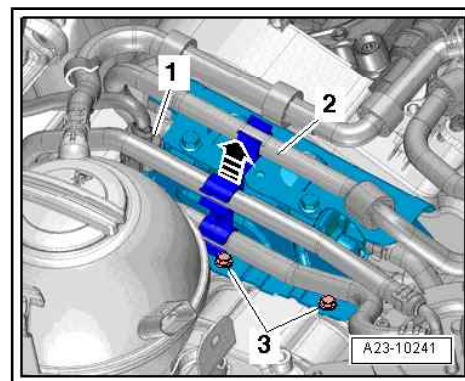
**Note**

*For reasons of clarity the fuel filter is not shown.*

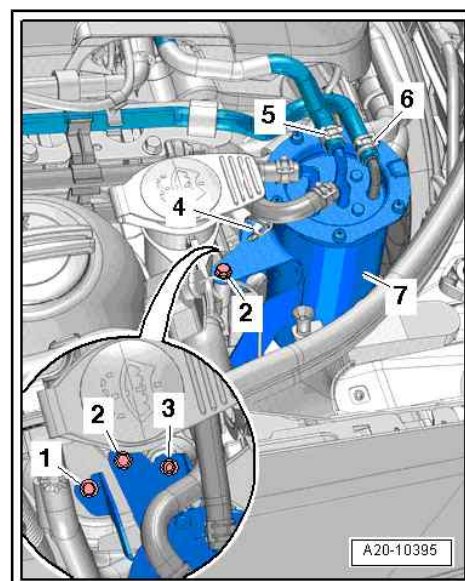




- Unhook the fuel hose -2- from the bracket.
- Remove the bracket for the fuel lines upwards -arrow- and lay to the side.
- Disconnect plug -1- at the additional fuel pump - V393- .
- Unscrew screws -3-.



- Release screw -1-.
- Release screw -2- and nut -3-.
- Remove hose bracket -4- from fuel filter.
- Place the fuel filter -7- with the hoses connected and the bracket together with the additional fuel pump - V393- to the side.
- Remove V-ribbed belt  
⇒ ["1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system", page 45](#) .



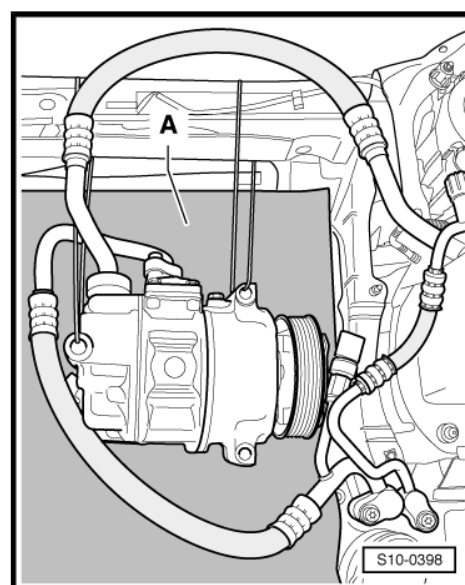
**WARNING**  
Do not open the refrigerant circuit of the air conditioning system.



#### Note

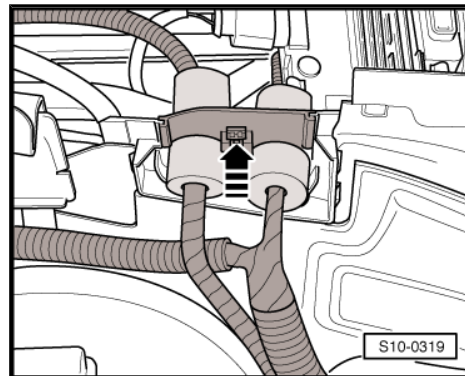
*In order to avoid damage to the AC compressor as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.*

- Remove the AC compressor from the bracket for auxiliary units, place a cardboard -A- underneath the charge air cooler for protection and secure the AC compressor with connected refrigerant hoses to the lock carrier.
- Unlatch the fuse and disconnect the front plug from the engine control unit  
⇒ ["4.2 Removing and installing engine control unit J623 Superb II, Yeti", page 310](#) .

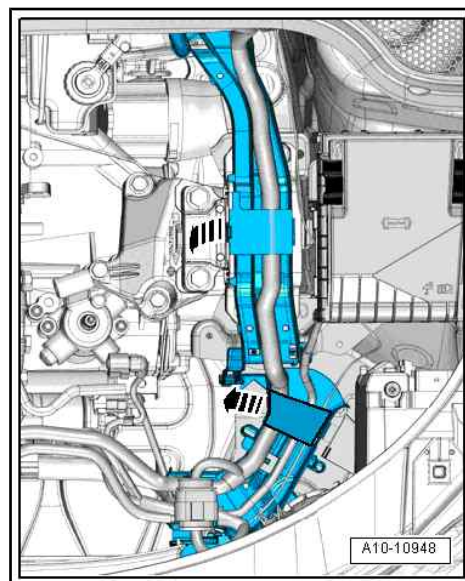




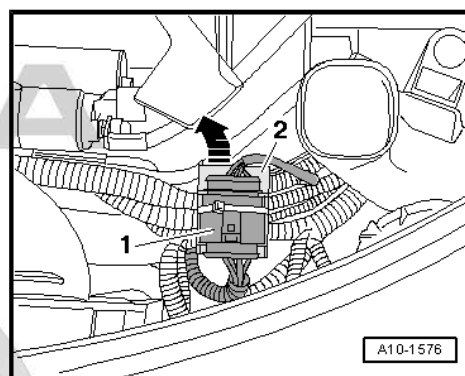
- Release duct for engine wiring harness -arrow- and pull out upwards.



- Open the cable guides -arrows-, remove the engine wiring harness and place down to the side.



- Expose the plug connection -1- and disconnect it.
- Open the bracket -2- lying below the cable guide.
- Remove the wiring loom to the engine control unit from the cable guide using the removal tool for inner lining of the door panel - MP8-602/1- and lay it on the engine.

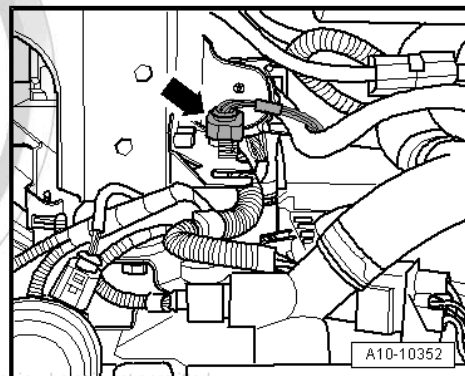


- Disconnect plug connection -arrow- at the bottom left frame side rail.



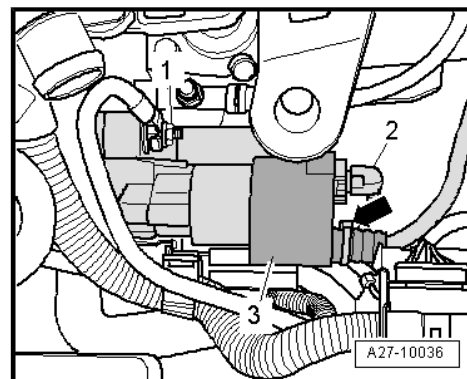
**Note**

*For purposes of presentation, the fitting position is shown from below.*



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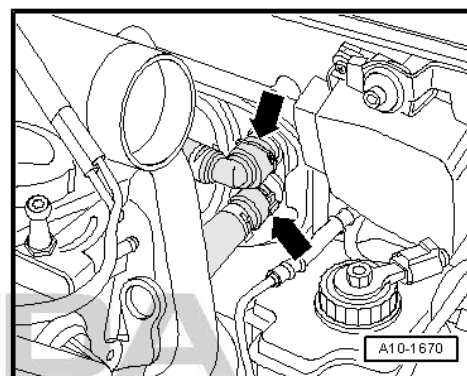
- Remove the cable strap of the -arrow- protective cover, if present.
- Unbolt earth cable -1-.
- Disconnect plug connection -2-.
- Pull back the protective cover and unscrew the B+ cable from the bracket of the solenoid switch for the starter.
- Disconnect further necessary plug connections at the engine and gearbox or line connections to engine and gearbox.



- Separate the quick couplings -arrows- at the heat exchanger.
- Pull off coolant hose at the top and bottom of the coolant expansion reservoir.

#### Vehicles with auxiliary heating

- Disconnect coolant hoses at auxiliary heating system.
- Remove exhaust pipe of auxiliary heating ⇒ Heating, Air Conditioning; Rep. gr. 82 .



#### Vehicles fitted with a manual gearbox

- Remove shift mechanism from gearbox ⇒ Gearbox; Rep. gr. 34 .
- Remove pressure line from breather/slave cylinder ⇒ Gearbox; Rep. gr. 30 .



#### WARNING

*After separating the hydraulic line, do not operate the clutch pedal.*

#### Vehicles with automatic gearbox

- Remove shift mechanism from gearbox ⇒ Automatic Gearbox; Rep. gr. 34 .

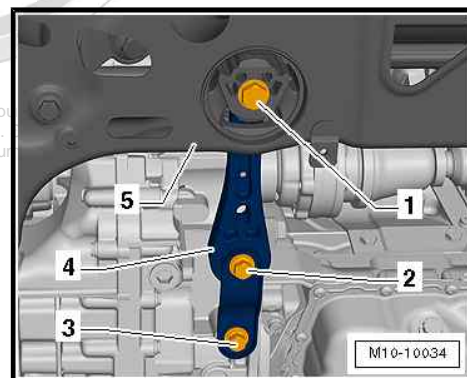
#### Continued for all vehicles

- Detach all connecting and vacuum hoses from the engine.
- Undo screws -1...3- and remove the pendulum support -4-.

#### Vehicles with four-wheel drive

- Remove propshaft from gearbox ⇒ Gearbox; Rep. gr. 39 .

#### Continued for all vehicles



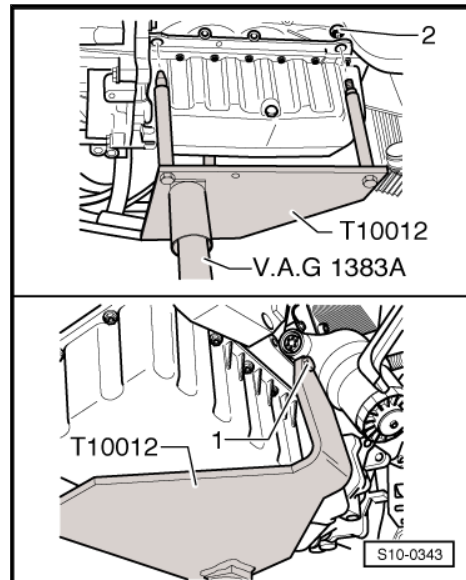


- Screw engine mount - T10012- to the cylinder block with nut -2- and screw -1- to 20 Nm.
- Insert engine/gearbox jack - V.A.G 1383 A- in the engine mount and slightly raise.

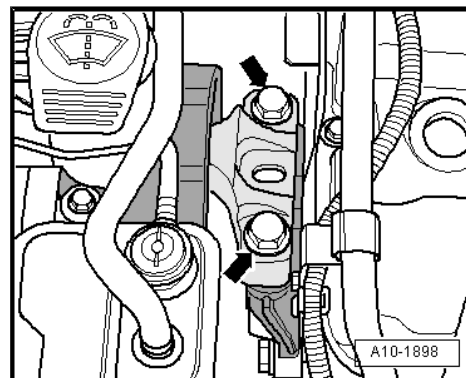


### Note

Use double ladder to release the screws for the engine/gearbox mounting.



- Successively release screws for engine mounting -arrows-.



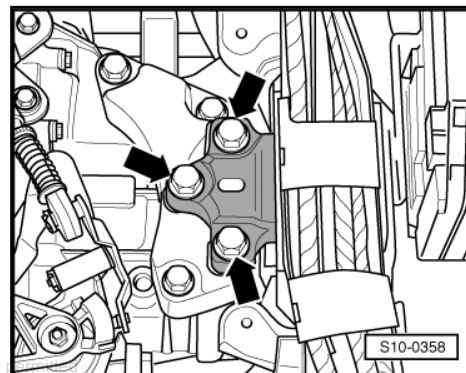
- Successively release screws for gearbox mounting -arrows-.



### Note

- ♦ Check whether all hose and line connections between engine, gearbox and body are released.
- ♦ When lowering carefully guide the engine with the gearbox, in order to avoid damage.

- Carefully lower engine with gearbox. If necessary, turn and push engine with gearbox.



- Remove the gearbox from the engine.

## 1.4 Securing the engine to the assembly stand



### Note

The assembly stand - VAS 6095- or the assembly stand - MP9-101- with engine bracket - MP1-202- can be used to secure the engine.

### Special tools and workshop equipment required

- ♦ Assembly stand - VAS 6095- or -MP9-101-



- ◆ Engine mount - MP1-202-
- ◆ Adapter - MP1-202/10-
- ◆ Lifting device - MP9-201 (2024A)-
- ◆ Bushing - T30010 (VW 540/1B)-
- ◆ Workshop crane , e.g. -VAS 6100-
- Separate engine from gearbox.



#### WARNING

*Use securing pins on the hooks and rig pins to prevent release.*

- Attach engine to the lifting device - MP9-201- and the workshop crane , e.g. -VAS 6100- .

#### Belt pulley end

- ◆ Second hole of the hanger in Position 1

#### Flywheel side

- ◆ Fourth hole of the hanger in Position 8



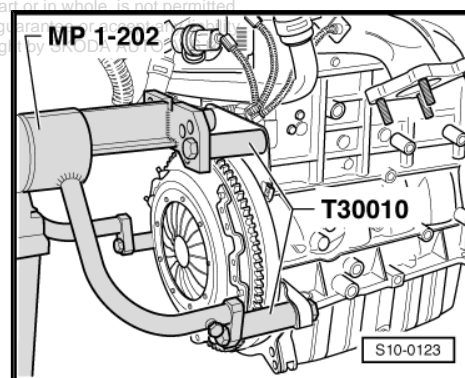
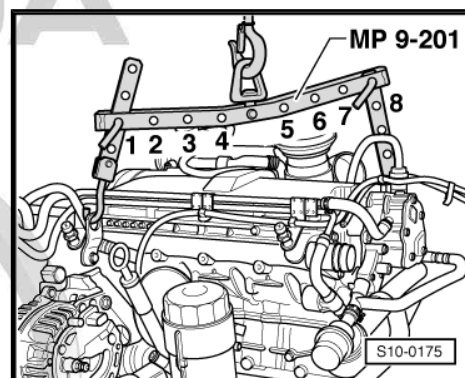
#### Note

*The illustration shows a pump injector engine. The attachment for the Common Rail engine occurs in the same way.*

- Lift engine with assembled engine mount - T10012- out of the engine/gearbox jack using the workshop crane .
- Remove engine mount - T10012- .
- Secure the engine to the assembly stand - VAS 6095- .

#### Securing the engine to the assembly stands - MP9-101-

- Secure the engine with engine bracket - MP1-202- , adapter - MP1-202/10- and bushing - T30010- to the assembly stand - MP9-101- ; (the illustration shows the 1.9/47 kW SDI engine; attachment is identical).



## 1.5 Installing engine

### Special tools and workshop equipment required

- ◆ Grease - G 000 100- for manual gearbox
- ◆ High temperature grease - G 052 133 A2- for automatic gearbox
- Fit engine and gearbox to engine mount on the engine/gearbox jack .

Installation is carried out in the reverse order. When installing, observe the following:



### Note

- ◆ *Observe all safety measures and notes for assembly work on the fuel supply and injection system, at the charge air system and observe as well the rules for cleanliness  
⇒ "2 Self diagnosis, safety measures, cleanliness regulations and directions", page 2.*
- ◆ *When undertaking assembly replace self-locking nuts and screws which have been tightened to a torquing angle.*
- ◆ *Always replace gasket rings and seals.*
- ◆ *All cable straps should be fastened again in the same place when installing.*
- ◆ *Secure all hose connections with corresponding hose clamps  
⇒ ETKA - Electronic Catalogue of Original Parts.*



### Caution

*When undertaking all installation work, particularly in the engine compartment due to its cramped construction, please observe the following:*

- ◆ *Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.*
- ◆ *To avoid damage to lines/wiring, ensure sufficient clearance to all moving or hot components.*

### For vehicles with manual gearbox



### Note

- ◆ *Clean the serration of the drive shaft and if the clutch disc has been used clean the hub serration, remove corrosion and only apply a very thin layer of grease - G 000 100- to the serration of the drive shaft. Subsequently move the clutch disc up and down on the drive shaft until the hub fits smoothly on the shaft. Always remove excess grease.*
- ◆ *After installing the coupling, check the centering of the clutch disc ⇒ Gearbox; Rep. gr. 30.*
- ◆ *Check the clutch release bearing for wear. Replace release bearing if worn ⇒ Gearbox; Rep. gr. 30.*

### For vehicles with automatic gearbox



### Note

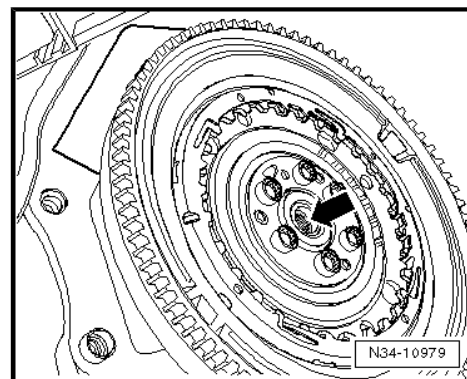
*Check needle bearing for drive shaft pin in the crankshaft. Replace bearing if worn  
⇒ "3.4 Replacing the needle bearing for crankshaft Octavia II, Superb II", page 83.*



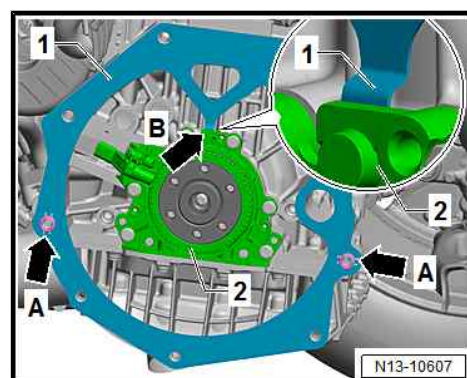
Lubricate needle bearing and drive shaft pin with a thin layer of high temperature grease -G 052 133 A2-. Do not grease the serration of the drive shaft.

#### Continued for all vehicles

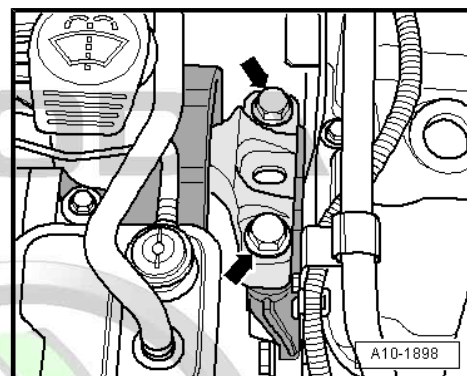
- Check whether dowel sleeves for centering engine / gearbox in cylinder block are available, insert if necessary.



- Ensure that the intermediate plate -1- has been inserted on the sealing flange -2- and is pushed onto the dowel sleeves arrows -A-.
- Screw on gearbox to engine ⇒ Gearbox; Rep. gr. 34 .
- Insert engine with gearbox into the body.



- Successively screw in screws for engine mounting -arrows- by hand.



- Successively screw in screws for gearbox mount -arrows- by hand.

- Align engine and gearbox mount and tighten screws:

#### ◆ Octavia II and Yeti

⇒ [“1.7 Checking and adjusting the assembly mounting, Octavia II, Yeti”, page 31](#) .

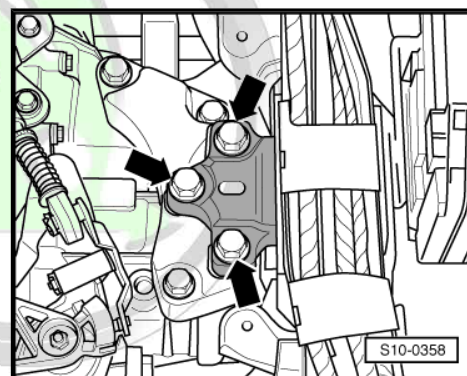
#### ◆ Superb II

⇒ [“1.8 Checking and adjusting the assembly bracket Superb II”, page 32](#) .

- Remove engine mount - T10012- from engine.

- Install pre-exhaust pipe with diesel particle filter

⇒ [“1.7 Removing and installing pre-exhaust pipe with diesel particle filter”, page 321](#) .



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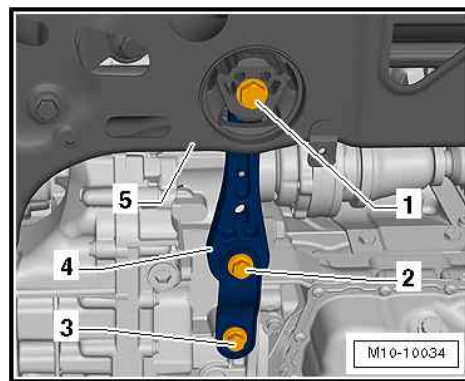
- Screw on pendulum support -4- with new screws -2- and -3- at gearbox and then screw on with new screw -1- at assembly carrier -5-.
- Install the left as well as the right drive shaft ⇒ Gearbox; Rep. gr. 40 .

#### Vehicles fitted with a manual gearbox

- Connect hydraulic line to clutch slave cylinder and bleed the clutch hydraulic ⇒ Gearbox; Rep. gr. 30 .
- Attach the shift mechanism to the gearbox and adjust ⇒ Gearbox; Rep. gr. 34 .

#### Vehicles with automatic gearbox

- Attach the shift mechanism to the gearbox ⇒ Gearbox; Rep. gr. 34 .



#### Continued for all vehicles

- Install AC compressor at the bracket for auxiliary units  
⇒ [“1.2 Summary of components - V-ribbed belt drive for vehicles with air conditioning system”, page 43](#) .
- Install the V-ribbed belt  
⇒ [“1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system”, page 45](#) .
- Install radiator  
⇒ [“4.3 Removing and installing radiator”, page 189](#) .
- Install fan shroud with radiator fans  
⇒ [“4.2 Removing and installing fan shroud for radiator fan”, page 188](#) , to do so ensure adequate clearance of the blower motors.
- Connect all connecting, fuel, cooling fluid, vacuum and suction hoses to the engine.
- Connect electrical connections and attach cables ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Carry out cohesive work when reconnecting the battery ⇒ Electrical System; Rep. gr. 27 .
- Install bulkhead plenum chamber and plenum chamber cover  
⇒ Body Work; Rep. gr. 66 .
- Install windscreen wiper arms ⇒ Electrical System; Rep. gr. 92 .
- Top up coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#) .
- Checking the oil level:
  - ◆ ⇒ Maintenance ; Booklet Octavia II .
  - ◆ ⇒ Maintenance ; Booklet Superb II .
  - ◆ ⇒ Maintenance ; Booklet Yeti .
- Install the noise insulation ⇒ Body Work; Rep. gr. 50 .
- Install the bottom part of the right and left wheelhouse liner ⇒ Body Work; Rep. gr. 66 .
- Perform a test drive.
- Query all fault memories, rectify any faults and delete fault memories ⇒ Vehicle diagnostic tester.



## Note

After deleting the event memory of the engine control unit the readiness code must be re-generated.

## Tightening torques

Component		Tightening torque
Screws or nuts	M6	10 Nm
	M7	15 Nm
	M8	20 Nm
	M10	45 Nm
	M12	60 Nm
Engine/gearbox connecting screws ⇒ Gearbox; Rep. gr. 34 ; .		

## 1.6 Assembly overview - assembly mountings

### 1 - Screw

- ☐ Tightening torque ⇒ Gearbox; Rep. gr. 34

### 2 - Bolts

- ☐ Replace after removal
- ☐ Strength class 8.8: 40 Nm + 90°
- ☐ Strength class 10.9: 50 Nm + 90°

### 3 - Engine support bracket

- ☐ Removing and installing ⇒ ["1.9 Removing and installing engine support", page 35](#)

### 4 - Screw

- ☐ Replace after removal
- ☐ Observe tightening sequence ⇒ ["1.9 Removing and installing engine support", page 35](#)
- ☐ 40 Nm + 180°

### 5 - Engine mounting

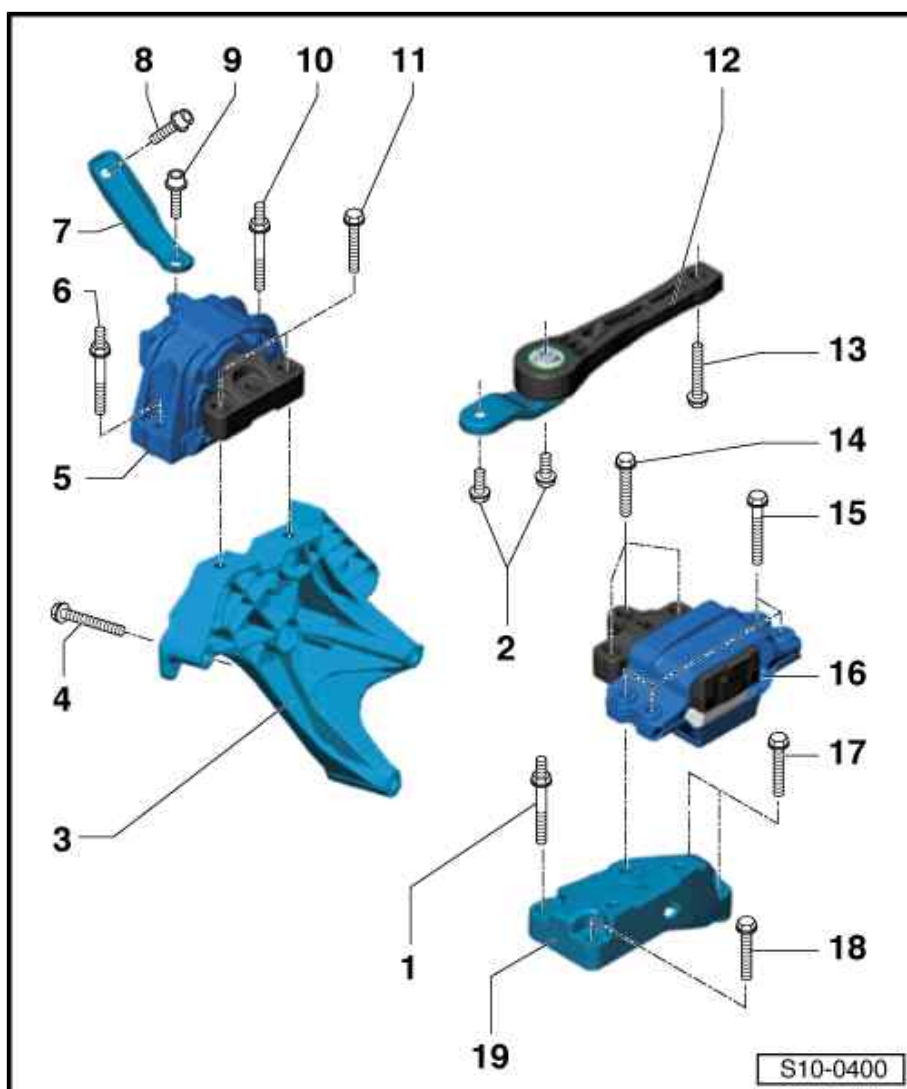
- ☐ Installing:

- ◆ Superb II ⇒ ["1.8 Checking and adjusting the assembly bracket Superb II", page 32](#)
- ◆ Octavia II, Yeti ⇒ ["1.7 Checking and adjusting the assembly mounting, Octavia II, Yeti", page 31](#)

- ☐ the bracket for the additional fuel pump - V393- is screwed onto the engine mount

### 6 - Screw

- ☐ Replace after removal



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- ☐ 40 Nm + 90°

## 7 - Connecting piece

### 8 - Screw

- ☐ Replace after removal
- ☐ 20 Nm + 90°

### 9 - Screw

- ☐ Replace after removal
- ☐ 20 Nm + 90°

### 10 - Screw

- ☐ Replace after removal
- ☐ 40 Nm + 90°

### 11 - Screw

- ☐ Replace after removal
- ☐ 60 Nm + 90°

## 12 - Pendulum support

### 13 - Screw

- ☐ Replace after removal
- ☐ 100 Nm + 90°

### 14 - Screw

- ☐ Replace after removal
- ☐ 60 Nm + 90°

### 15 - Screw

- ☐ Replace after removal
- ☐ 40 Nm + 90°

## 16 - Gearbox mount

### 17 - Screw

- ☐ Tightening torque ⇒ Gearbox; Rep. gr. 34

### 18 - Screw

- ☐ Tightening torque ⇒ Gearbox; Rep. gr. 34

## 19 - Gearbox support bracket

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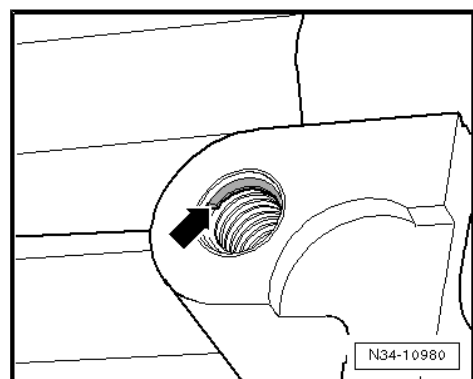


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### Note

- ◆ Remove pendulum support: First remove screw -13-, then screws -2-.
- ◆ Install pendulum support: First tighten screws -2-, then screw -13-.
- ◆ On manual gearbox MQ350 (02Q), only use the screws with the strength category 10.9 if threaded inserts (e.g. Heli Coil) -arrow- have been installed.



## 1.7 Checking and adjusting the assembly mounting, Octavia II, Yeti

⇒ [“1.7.1 Checking the assembly bracket”, page 31](#)

⇒ [“1.7.2 Adjusting the unit mounting”, page 31](#)

Special tools and workshop equipment required

- ◆ Supporting device - T30099-
- ◆ Surface - T30099/1-
- ◆ Adapter - MP9-200/3 (10-222A/3)-

or

- ◆ Engine mount - T10012-
- ◆ Engine/gearbox jack , e.g. -V.A.G 1383 A-

### 1.7.1 Checking the assembly bracket

Check dimensions on the right hanger for engine/gearbox unit:

- Between engine bracket and engine support there must be a distance -a- of 10 mm.
- The cast iron edge on the engine support -2- must be parallel to the supporting arm -1- the dimension -x- must be the same at the front and rear.

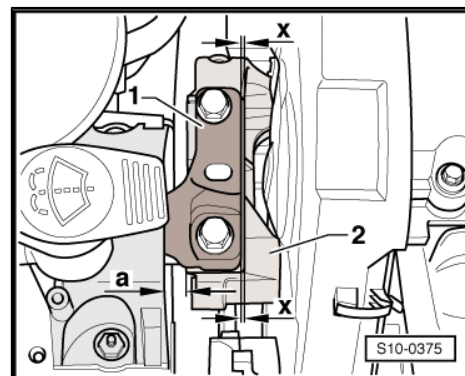


Note

*The distance -a- can be checked e.g. with suitable round bars.*

Only if there is an acoustic complaint (engine or gearbox knock on the frame side rail when cornering) and the dimension -a- is not 10 mm:

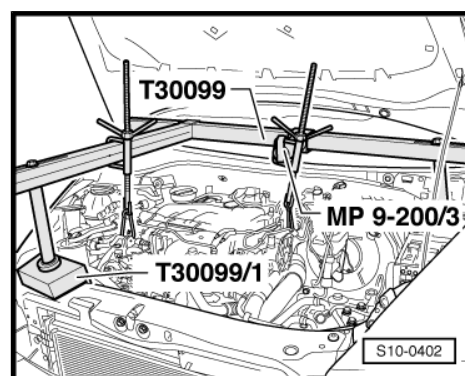
- Adjust the assembly bracket  
⇒ [“1.7.2 Adjusting the unit mounting”, page 31](#) .



### 1.7.2 Adjusting the unit mounting

Condition

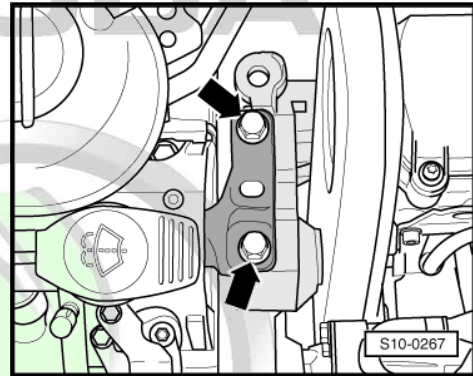
- Engine and gearbox held by supporting device - T30099- , supporting plate - T30099/1- and adapter - MP9-200/3- or engine with gearbox supported by engine mount and engine/gearbox jack - V.A.G 1383 A- .



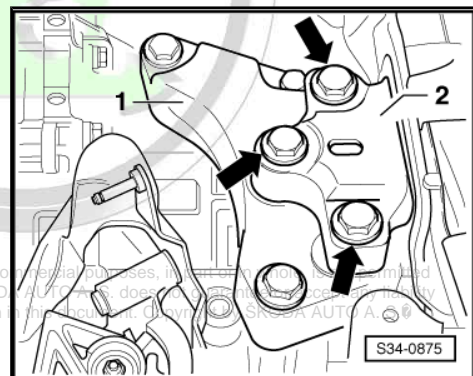




- Slacken screws -arrows- of engine bracket by approx. 1 turn.



- Slacken screws -arrows- of gearbox bracket by approx. 1 turn.
- Successively replace all the screws of the assembly bracket (as long as it has not already been performed when installing) and insert these loosely.



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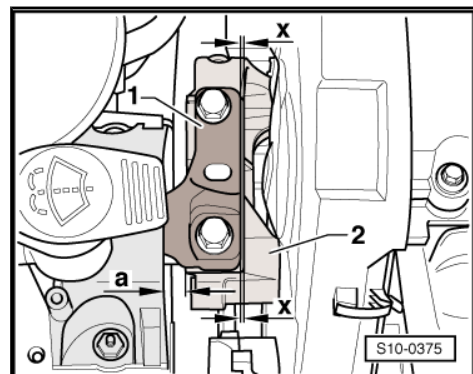
The following dimensions -a- and -x- must be maintained:

- Between engine bracket and engine support there must be a distance -a- = 10 mm.
- The cast iron edge on the engine support -2- must be parallel to the supporting arm -1- the dimension -x- must be the same at the front and rear.



#### Note

The distance -a- = 10 mm can be checked e.g. with suitable round bars.



- Tighten the screws of the assembly bracket.

#### Tightening torques

- ♦ Screws for assembly bracket  
⇒ [“1.6 Assembly overview - assembly mountings”, page 29](#)

## 1.8 Checking and adjusting the assembly bracket Superb II

⇒ [“1.8.1 Checking the assembly bracket”, page 33](#)

⇒ [“1.8.2 Adjusting the unit mounting”, page 33](#)

#### Special tools and workshop equipment required

- ♦ Supporting device - MP9-200 (10-222A)-
- ♦ Adapter - MP9-200/3 (10-222A/3)-
- ♦ Wing plates - T10311-

## 1.8.1 Checking the assembly bracket

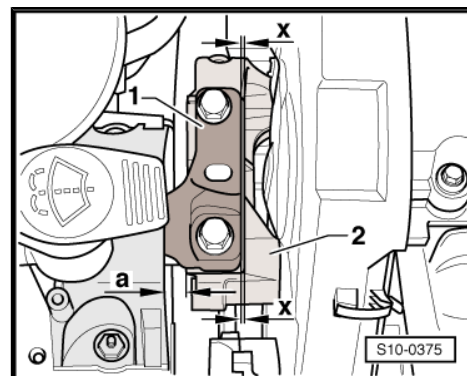
Check dimensions on the right hanger for engine/gearbox unit:

- Between engine bracket and engine support there must be a distance -a- of 10 ... 13 mm.
- The cast iron edge on the engine support -2- must be parallel to the supporting arm -1- the dimension -x- must be the same at the front and rear.



### Note

The distance -a- can be checked, for example with suitable round bars.



Only if there is an acoustic complaint (engine or gearbox knock on the frame side rail when cornering) and the dimension -a- is not 10...13 mm:

- Adjust the assembly bracket  
⇒ ["1.8.2 Adjusting the unit mounting", page 33](#).

## 1.8.2 Adjusting the unit mounting

### Condition

- Engine with gearbox supported with supporting device - MP9-200 (10-222A)- and adapter - MP9-200/3- or engine with gearbox supported with engine mount and engine/gearbox jack .
- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .
- Remove the front stop buffers for the front flap from both upper edges of the wings at the front.

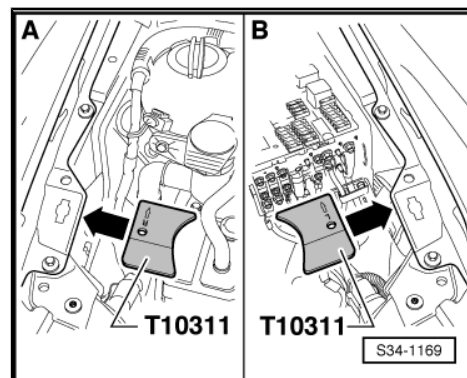
Insert the wing plate - T10311- on the right vehicle side -A- in the -direction of the arrow- up to the stop. When doing this, the arrow -R- on the wing plate - T10311- points to the rear.

- Also insert the wing plate - T10311- on the left vehicle side -B- in the -direction of the arrow- up to the stop. When doing this, the arrow -L- on the wing plate - T10311- points to the rear.



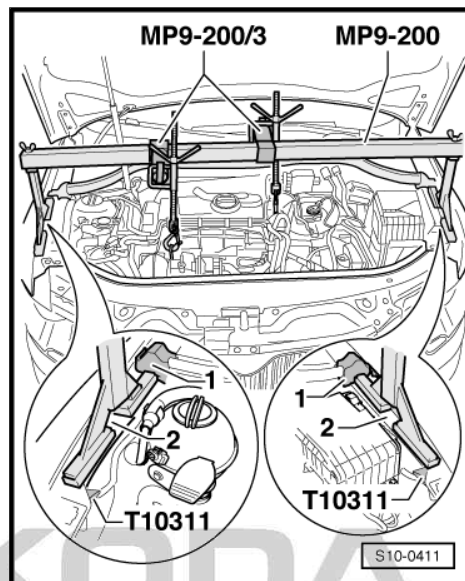
### Note

The wing plates -T10311- ensure that the wings do not get damaged through the weight of the engine/gearbox unit.

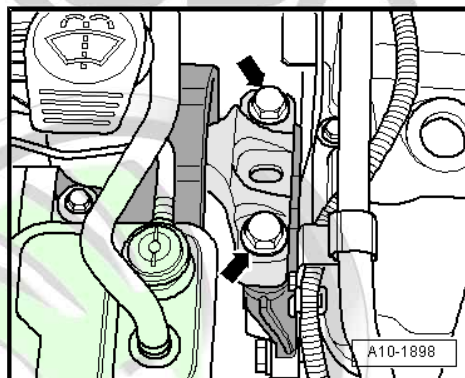




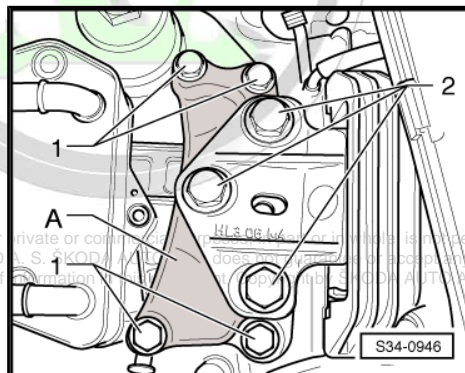
- Install supporting device - MP9-200 (10-222A)- with adapters - MP9-200/3 (10-222A/3)- and support engine/gearbox assembly in fitting position.
- The feet of the supporting device - MP9-200 (10-222A)- must be pushed as shown in the illustration up to the stop buffers -1- and placed on the wheelhouse frame side rail at the top -2-.
- Uniformly pre-tension the engine/gearbox unit with both spindles, but do not raise.



- Release the screws -arrows- of the assembly bracket at the engine.



- Slightly loosen the screws -2- of the unit mounting at the gearbox (less than 1 revolution).
- Successively replace all the screws of the assembly bracket (as long as it has not already been performed when installing the engine) and insert these loosely.



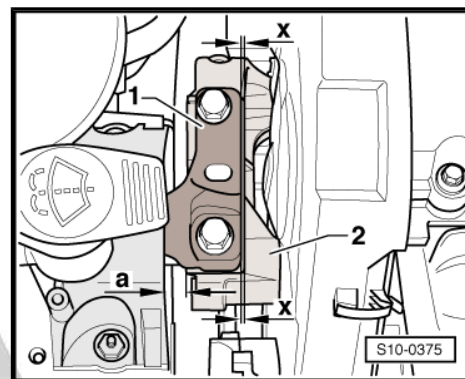
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- Move the engine/gearbox assembly with an assembly lever between engine support 1 and supporting arm 3 for engine mount until the following dimensions are set:
- Between engine bracket and engine support there must be a distance -a- of 10 mm.
- The cast iron edge on the engine support -2- must be parallel to the supporting arm -1- the dimension -x- must be the same at the front and rear.



#### Note

The distance -a- = 10 mm can be checked e.g. with suitable round bars.



- Tighten screws for engine assembly bracket  
⇒ [“1.6 Assembly overview - assembly mountings”, page 29](#) .

Further installation occurs in reverse order.

## 1.9 Removing and installing engine support

### Special tools and workshop equipment required

- ◆ Support bracket - T30099- (Octavia II, Yeti)
- ◆ Base - T30099/1- (Octavia II, Yeti)
- ◆ Supporting device - MP9-200 (10-222A)- (Superb II)
- ◆ Wing plates - T10311- (Superb II)
- ◆ Adapter - MP9-200/3 (10-222A/3)-

### Removing



#### Caution

*When undertaking all installation work, particularly in the engine compartment because of its cramped construction, please observe the following:*

- ◆ Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.
- ◆ To avoid damage to lines/wiring, ensure sufficient clearance to all moving or hot components.



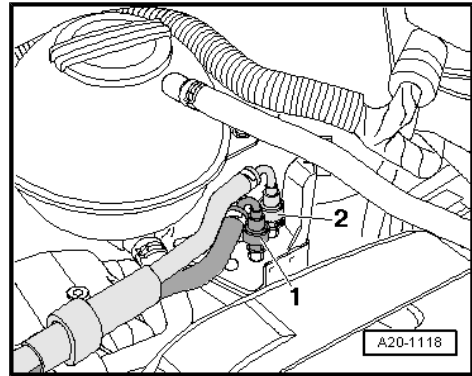
#### Note

- ◆ Safety precautions when working on the fuel supply system  
⇒ [“2.3 Safety precautions when working on fuel supply system”, page 3](#) .
- ◆ Observe rules for cleanliness  
⇒ [“2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system”, page 4](#) .
- Switch off ignition and pull out ignition key.
- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .





- Separate fuel feed line -2- and fuel return-flow line -1-, to do so press in securing rings. Unlock the quick coupling and disconnect ➔ [“2.9 Separating push-on couplings”, page 216](#) .

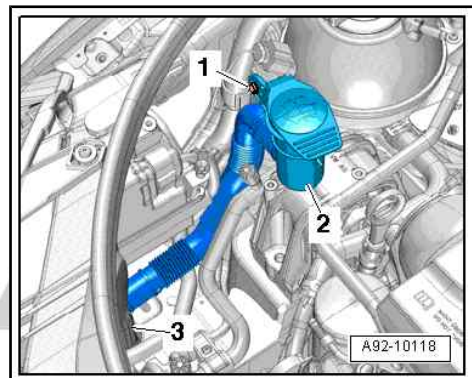


- Unscrew bolt -1-.
- Push the filler tube with the filler neck -2- for the washer-fluid reservoir to the side.

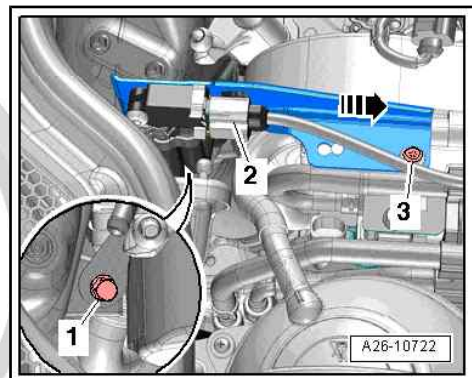


#### Note

For reasons of clarity the fuel filter is not shown.



- Disconnect plug connection -2- at exhaust gas pressure sensor 1 - G450- .
- Screw out screw -3- and remove bracket with exhaust gas pressure sensor 1 - G450- from the bracket for the additional fuel pump in -direction of arrow-.
- Place the bracket with the exhaust gas pressure sensor 1 - G450- to the rear.

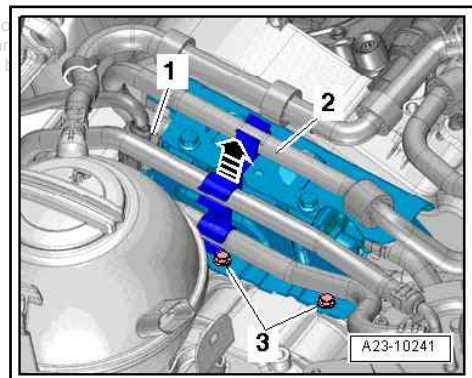


#### Caution

##### Risk of damage!

- ♦ *The exhaust gas pressure sensor 1 - G450- is very sensitive and must therefore not touch somewhere when laying it down with the bracket.*

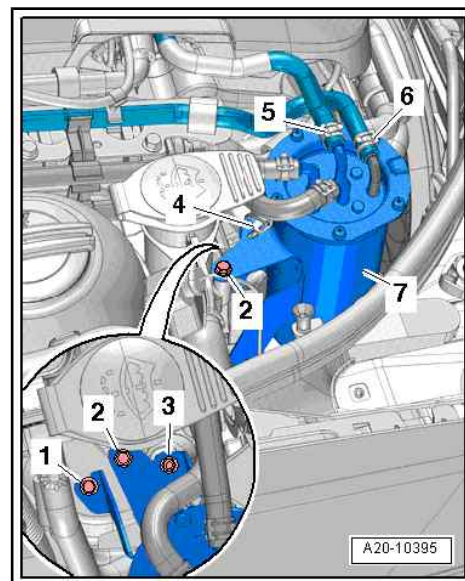
- Unhook the fuel hose -2- from the bracket.
- Remove the bracket for the fuel lines upwards -arrow- and lay to the side.
- Disconnect plug -1- at the additional fuel pump - V393- .
- Unscrew screws -3-.
- Unplug connector from expansion reservoir.
- Unscrew the screws of the expansion reservoir.





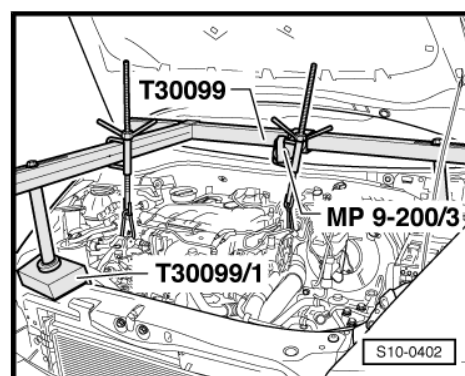
- Release screw -1- by two turns.
- Release screw -2- and nut -3-.
- Unclip bracket for coolant line at fuel filter.
- Lay the compensation bottle with the hoses connected, the fuel filter with the hoses connected and the bracket with the additional fuel pump - V393- onto the engine.
- Remove plenum chamber cover ⇒ Body Work; Rep. gr. 66 .

**For the vehicles Octavia II, Yeti**



- Position the supporting device - T30099- with the base - T30099/1- and the adapter - MP9-200/3- and support the engine in its installed position.

**For the vehicles Superb II**



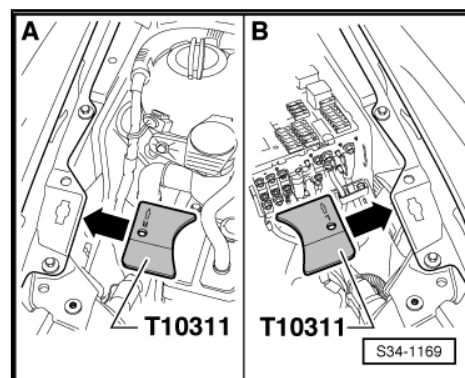
- Insert the wing plate - T10311- on the right vehicle side -A- in the -direction of the arrow- up to the stop. When doing this, the arrow -R- on the wing plate - T10311- points to the rear.
- Also insert the wing plate - T10311- on the left vehicle side -B- in the -direction of the arrow- up to the stop. When doing this, the arrow -L- on the wing plate - T10311- points to the rear.



**Note**

*The wing plates -T10311- ensure that the wings do not get damaged through the weight of the engine/gearbox unit.*

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- Install supporting device - MP9-200 (10-222A)- with adapters - MP9-200/3 (10-222A/3)- and support engine/gearbox assembly in fitting position.

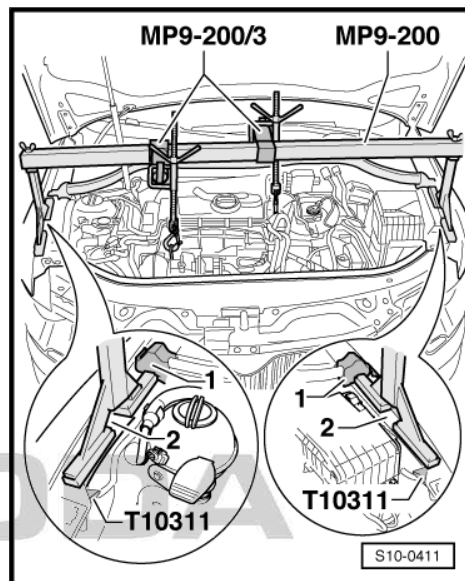
#### Continued for all vehicles

- Uniformly pre-tension the engine/gearbox unit at both spindles, do not raise.
- Remove engine mounts.
- Remove the front right wheelhouse liner ⇒ Body Work; Rep. gr. 66 .



#### WARNING

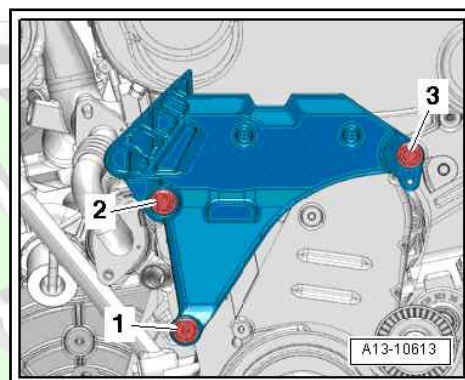
***Make sure that no components/hoses are damaged, overstretched or torn off when lifting and lowering the engine with the supporting device - T30099- .***



#### Note

*The fixing screw -2- is accessible through the hole in the wheelhouse. If necessary, raise or lower the engine via the spindles of the supporting device - MP9-200 (10-222A)- so that the screws -1- and -3- can be removed.*

- Unscrew the fixing screws for the engine support in the sequence -3 - 2 - 1-.
- Remove the engine support upwards.



#### Installing



#### Caution

***The tightening sequence and the tightening torque of the fixing screws for the engine support must definitely be respected. Otherwise stress of the engine support bracket occurs, which results in the breaking of the engine support bracket.***

Installation is carried out in the reverse order. However, pay attention to the following:

- Place the engine support from the top.



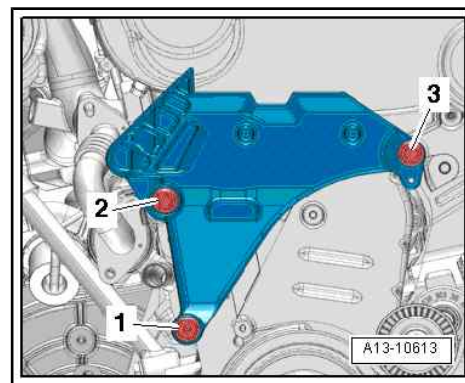
## Note

*The installation of the fixing screw -2- is possible through the hole in the wheelhouse. If necessary, raise or lower the engine via the spindles of the supporting device - MP9-200 (10-222A)- so that the screws -1- and -3- can be removed.*

- Tighten the fixing screws in the sequence -1 - 2 - 3- to 7 Nm.
- Tighten the fixing screws to 40 Nm + 180° in sequence -1 - 2 - 3-.
- Install engine support with new screws  
⇒ [“1.6 Assembly overview - assembly mountings”, page 29](#) .
- Check the setting of the assembly bracket at the engine:
- ◆ Octavia II, Yeti  
⇒ [“1.7 Checking and adjusting the assembly mounting, Octavia II, Yeti”, page 31](#) .
- ◆ Superb II  
⇒ [“1.8 Checking and adjusting the assembly bracket Superb II”, page 32](#) .
- Tighten screws for engine mount  
⇒ [“1.6 Assembly overview - assembly mountings”, page 29](#) .

Further installation occurs in reverse order. However, pay attention to the following:

- ◆ Make sure the fuel lines fit tightly.
- ◆ Do not mix-up the feed line and the return-flow line (the return-flow line is blue or has a blue marking, the feed line is black).



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## 13 – Crankshaft group

### 1 Removing and installing a V-ribbed belt and a toothed belt

⇒ [“1.1 Summary of components - V-ribbed belt drive for vehicles without air conditioning system”, page 40](#)

⇒ [“1.2 Summary of components - V-ribbed belt drive for vehicles with air conditioning system”, page 43](#)

⇒ [“1.3 Removing and installing V-ribbed belt for vehicles without air conditioning system”, page 45](#)

⇒ [“1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system”, page 45](#)

⇒ [“1.5 Removing and installing tensioning element for V-ribbed belt”, page 47](#)

⇒ [“1.6 Removing and installing vibration damper”, page 48](#)

⇒ [“1.7 Removing and installing bracket for auxiliary units”, page 49](#)

⇒ [“1.8 Assembly overview - toothed belt drive”, page 52](#)

⇒ [“1.9 Removing and installing toothed belt”, page 55](#)

#### 1.1 Summary of components - V-ribbed belt drive for vehicles without air conditioning system

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## 1 - V-ribbed belt

- ☐ Removing and installing  
⇒ [“1.3 Removing and installing V-ribbed belt for vehicles without air conditioning system”, page 45](#)
- ☐ check for wear, replace if damaged
- ☐ do not kink
- ☐ pay attention to the correct position on the belt pulley when installing it.

## 2 - Vibration damper

- ☐ with vibration damper
- ☐ pay attention to correct installation position  
⇒ [page 42](#)
- ☐ Removing and installing  
⇒ [“1.6 Removing and installing vibration damper”, page 48](#)

## 3 - Screw

- ☐ Replace after removal
- ☐ 10 Nm + 90°

## 4 - Fitting sleeve

- ☐ pay attention to correct fit in the bracket for auxiliary units
- ☐ The dowel sleeve is located in the top right screw hole ⇒ [page 45](#)

## 5 - Screw

- ☐ for high pressure pump
- ☐ different lengths
- ☐ Tightening torques ⇒ [“2.1 Assembly overview - fuel system”, page 271](#)

## 6 - Screw

- ☐ Replace after removal
- ☐ 50 Nm + 90°

## 7 - Guide pulley

- ☐ for toothed belt

## 8 - Screw

- ☐ 20 Nm

## 9 - Guide pulley

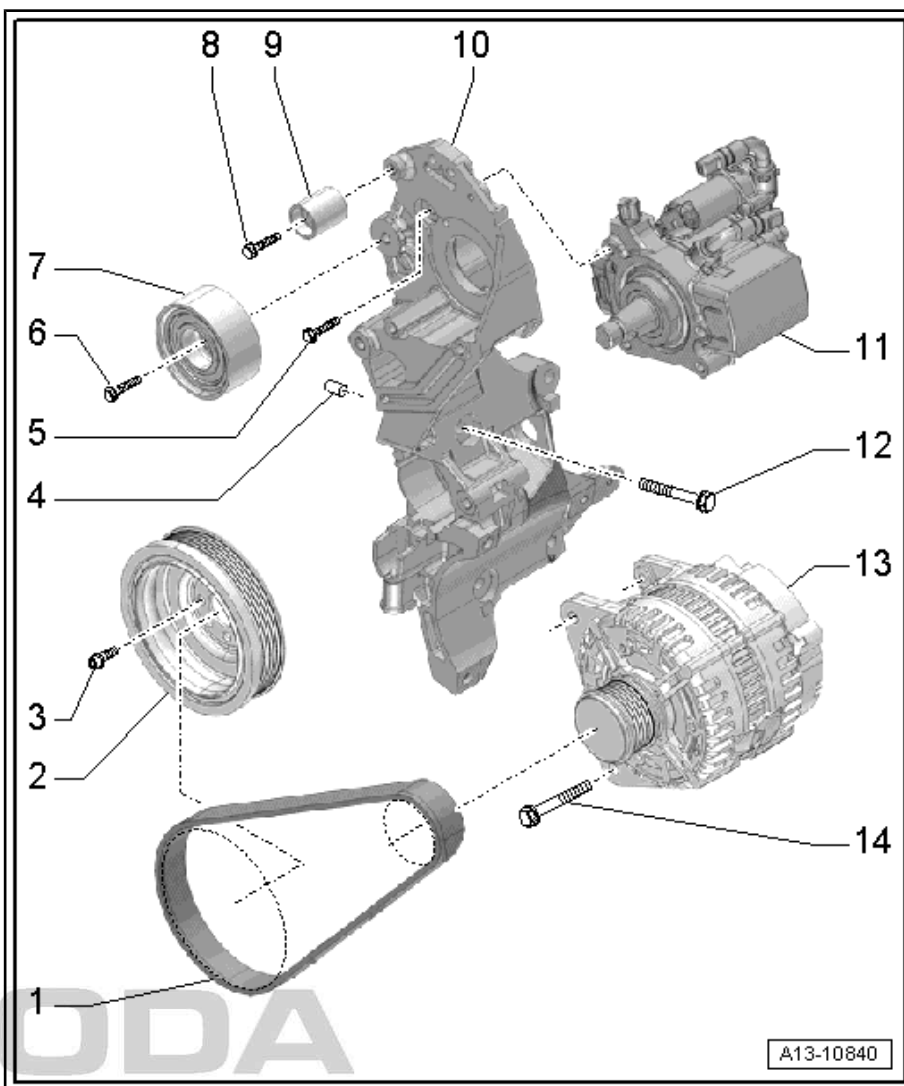
- ☐ for toothed belt

## 10 - Bracket for auxiliary units

- ☐ Removing and installing ⇒ [“1.7 Removing and installing bracket for auxiliary units”, page 49](#)
- ☐ a lifting eye is located on the bracket at the front left, similar to the attachment of the front left lifting eye at the cylinder block ⇒ [“1.3 Summary of components - cylinder head”, page 99](#)

## 11 - High pressure pump

- ☐ Removing and installing ⇒ [“2.8 Removing and installing the high pressure pump”, page 287](#)







## 12 - Screw

- ☐ Replace after removal
- ☐ different lengths
- ☐ tightening order and tightening torque ⇒ [page 42](#)

## 13 - Alternator

- ☐ Removing and installing ⇒ Electrical System; Rep. gr. 27

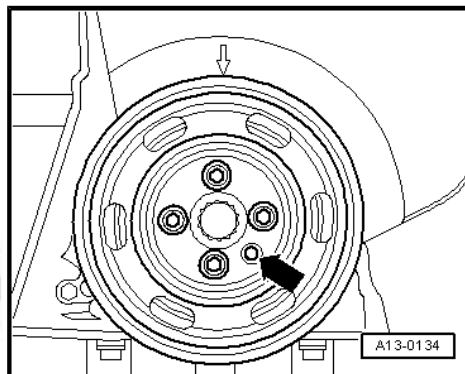
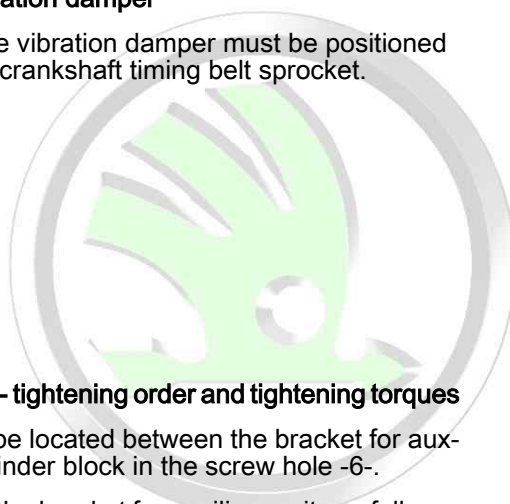
## 14 - Screw

- ☐ 23 Nm

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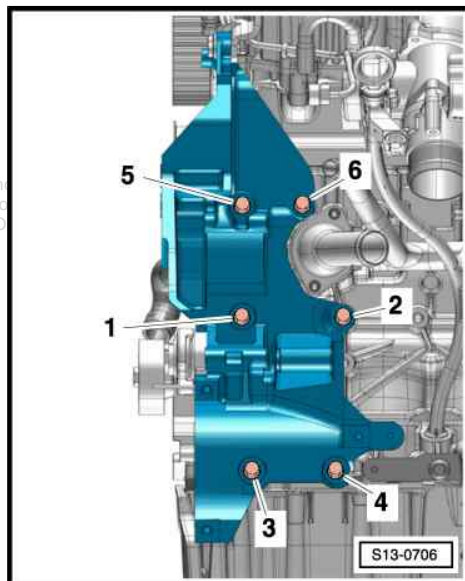
### Fitting position of the vibration damper

- The hole -arrow- in the vibration damper must be positioned above the peg on the crankshaft timing belt sprocket.



### Bracket for auxiliary units - tightening order and tightening torques

- A dowel sleeve must be located between the bracket for auxiliary units and the cylinder block in the screw hole -6-.
- Insert new screws for the bracket for auxiliary units as follows:
  - ◆ Screws -1- and -2- M10 x 52
  - ◆ Screws -3- and -4- M10 x 30
  - ◆ Screws -5- and -6- M10 x 60
- Gradually tighten the fixing screws for the bracket for auxiliary units in the sequence -1...6-:
  1. Screw in all the screws by hand.
  2. Tighten all bolts initially to 40 Nm.
  3. Torque the screws with a rigid wrench as follows:
    - ◆ Turn the screws -1- and -2- a further 90°.
    - ◆ Turn the screws -3- and -4- a further 45°.
    - ◆ Turn the screws -5- and -6- a further 90°.



## 1.2 Summary of components - V-ribbed belt drive for vehicles with air conditioning system

### 1 - V-ribbed belt

- ☐ Removing and installing  
⇒ [“1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system”, page 45](#)
- ☐ check for wear
- ☐ mark the direction of rotation with chalk or a felt-tip pen before removing
- ☐ do not kink
- ☐ pay attention to the correct position on the belt pulley when installing it.

### 2 - Tensioner for V-ribbed belt

- ☐ Removing and installing  
⇒ [“1.5 Removing and installing tensioning element for V-ribbed belt”, page 47](#)

### 3 - Vibration damper

- ☐ with vibration damper
- ☐ pay attention to correct installation position  
⇒ [page 44](#)
- ☐ Removing and installing  
⇒ [“1.6 Removing and installing vibration damper”, page 48](#)

### 4 - Screw

- ☐ Replace after removal
- ☐ 10 Nm + 90°

### 5 - Screw

- ☐ 23 Nm

### 6 - Fitting sleeve

- ☐ pay attention to correct fit in the bracket for auxiliary units
- ☐ The dowel sleeve is located in the top right screw hole ⇒ [page 45](#)

### 7 - Screw

- ☐ for high pressure pump
- ☐ different lengths
- ☐ Tightening torques ⇒ [“2.1 Assembly overview - fuel system”, page 271](#)

### 8 - Screw

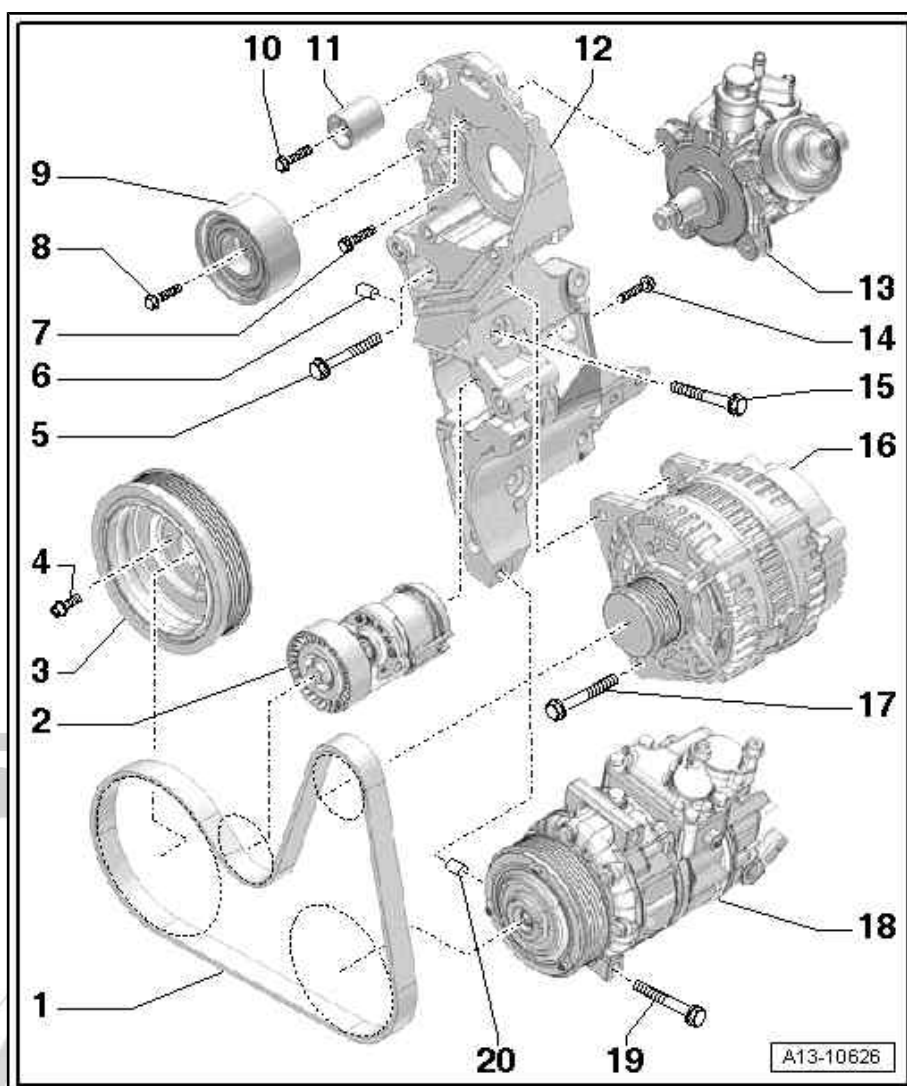
- ☐ Replace after removal
- ☐ 50 Nm + 90°

### 9 - Guide pulley

- ☐ for toothed belt

### 10 - Screw

- ☐ 20 Nm



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### 11 - Guide pulley

- ☐ for toothed belt

### 12 - Bracket for auxiliary units

- ☐ Removing and installing ⇒ [“1.7 Removing and installing bracket for auxiliary units”, page 49](#)
- ☐ a lifting eye is located on the bracket at the front left, similar to the attachment of the front left lifting eye at the cylinder block ⇒ [“1.3 Summary of components - cylinder head”, page 99](#)

### 13 - High pressure pump

- ☐ Removing and installing ⇒ [“2.8 Removing and installing the high pressure pump”, page 287](#)

### 14 - Screw

- ☐ Replace after removal
- ☐ 20 Nm + 180°

### 15 - Screw

- ☐ Replace after removal
- ☐ different lengths
- ☐ tightening order and tightening torque ⇒ [page 45](#)

### 16 - Alternator

- ☐ Removing and installing ⇒ Electrical System; Rep. gr. 27

### 17 - Screw

- ☐ 23 Nm

### 18 - AC compressor

- ☐ removing and installing ⇒ Heating, Air Conditioning; Rep. gr. 87

### 19 - Screw

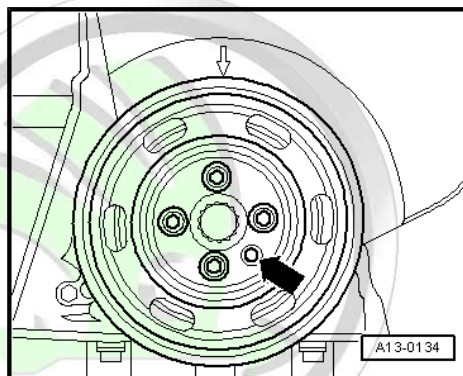
- ☐ 25 Nm

### 20 - Fitting sleeve

- ☐ pay attention to correct fit in the holder

### Fitting position of the vibration damper

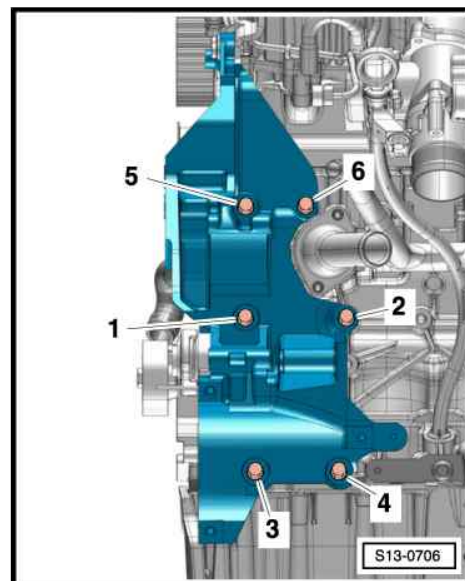
- The hole -arrow- in the vibration damper must be positioned above the peg on the crankshaft timing belt sprocket.



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### Bracket for auxiliary units - tightening order and tightening torques

- A dowel sleeve must be located between the bracket for auxiliary units and the cylinder block in the screw hole -6-.
- Insert new screws for the bracket for auxiliary units as follows:
  - ◆ Screws -1- and -2- M10 x 52
  - ◆ Screws -3- and -4- M10 x 30
  - ◆ Screws -5- and -6- M10 x 60
- Gradually tighten the screws for the bracket for auxiliary units in the sequence -1...6-:
  1. Tighten all the screws by hand.
  2. Tighten all screws to 40 Nm.
  3. Turn the screws -3- and -4- a further 45°.
  4. Turn the screws -1-, -2-, -5- and -6- a further 90°.



## 1.3 Removing and installing V-ribbed belt for vehicles without air conditioning system



### Note

The repair kit includes the V-ribbed belt, the assembly tool - T10367- and an illustrated work procedure ➔ ETKA - Electronic Catalogue of Original Parts .

### Removing

- Remove noise insulation ➔ Body Work ➔ Rep. gr. 50 .
- Remove the right wheelhouse liner ➔ Body Work ➔ Rep. gr. 66 .
- Cut through the V-ribbed belt.

### Installing

Assembly is carried out in the reverse order. When installing, observe the following:



### Note

How to install the V-ribbed belt is described in the illustrated work procedure from the repair kit.

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- Start engine and check ribbed V-belt run.

## 1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system

### Special tools and workshop equipment required

- ◆ Locking pin - T10060 A-

### Removing

- Remove noise insulation ➔ Body Work; Rep. gr. 50 .
- Removing the right wheel-well inner panel ➔ Body Work; Rep. gr. 66 .



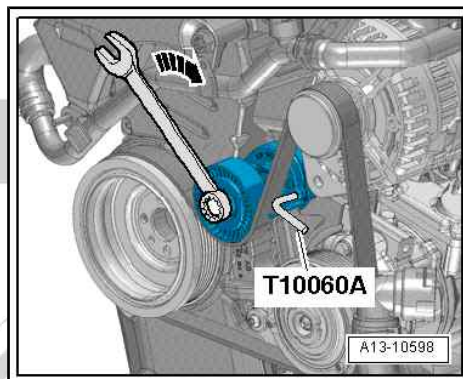


### Caution

*Risk of damage by reversing the direction of rotation of a V-ribbed belt that has already been used.*

- ◆ *If it is intended to re-install the V-ribbed belt, mark the direction of rotation with chalk or a felt-tip pen before removing it.*

- Loosen the V-ribbed belt by swivelling the tensioning element in -the direction of the arrow-.



- Align the holes -arrows- and lock the tensioning element using the locking pin - T10060 A- .
- Remove the V-ribbed belt.

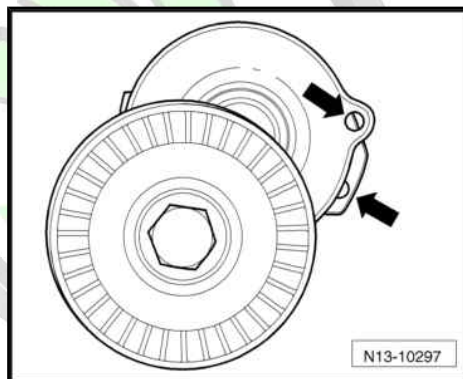
### Installing

Installation is carried out in the reverse order. When installing, observe the following:



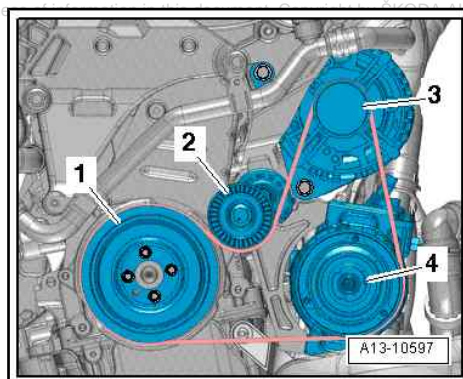
### Note

*Before fitting the V-ribbed belt make sure that all assemblies (generator and AC compressor) are securely mounted.*



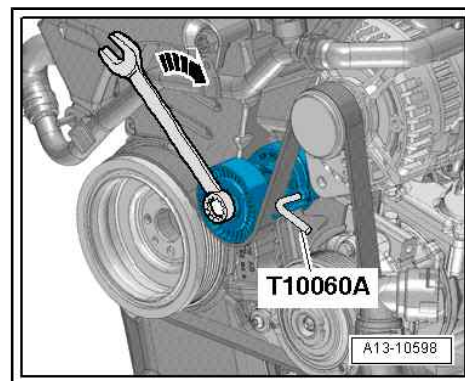
- Lay the V-ribbed belt onto the V-ribbed belt pulleys.

- 1 - Crankshaft
- 2 - Tensioning element
- 3 - Alternator
- 4 - AC compressor



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- Hold the tensioning element with the ring spanner and pull out the locking pin - T10060 A- .
- Release the tensioning element.
- Check correct positioning of the V-ribbed belt.
- Start engine and check ribbed V-belt run.



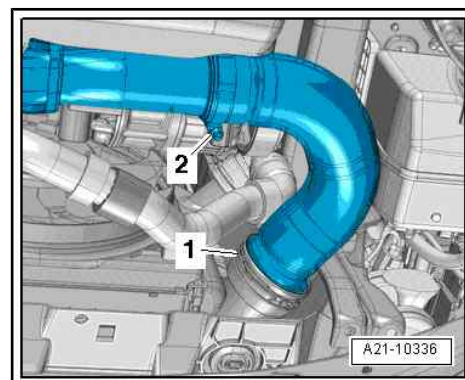
## 1.5 Removing and installing tensioning element for V-ribbed belt

Special tools and workshop equipment required

- ◆ Radiator protection mat - VAS 531003-

### Removing

- Remove V-ribbed belt from tensioning element  
⇒ [“1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system”, page 45](#) .
- Remove the right charge air hose, to do so loosen the hose clamp -2- and slightly raise the clamp -1-.
- Remove fan shroud with radiator fans  
⇒ [“4.2 Removing and installing fan shroud for radiator fan”, page 188](#) .

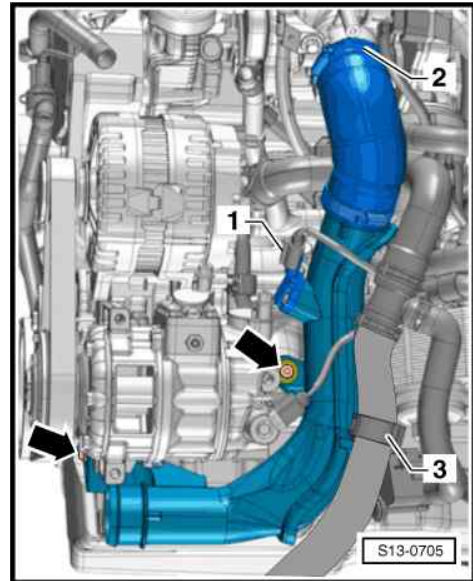


- Cover radiator with radiator protection mat - VAS 531003- .





- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Loosen hose clamp -2-.
- Disconnect plug -1- at the charge pressure sender - G31- and remove the right charge air pipe.

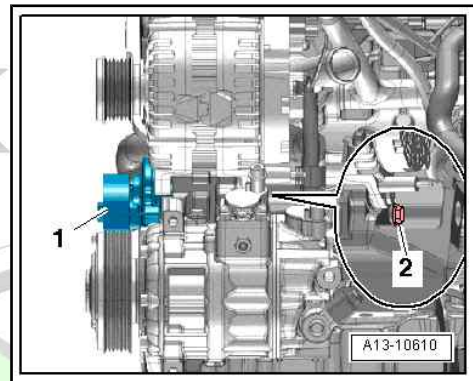


- Unscrew screw -2- and remove tensioning element -1- from V-ribbed belt.

### Installing

Installation is carried out in the reverse order. When installing, observe the following:

- Replace the screw of the tensioning element for the V-ribbed belt.
- Install the V-ribbed belt  
⇒ [“1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system”, page 45](#) .



### Tightening torques

- ♦ Screw for the tensioning element  
⇒ [“1.2 Summary of components - V-ribbed belt drive for vehicles with air conditioning system”, page 43](#)
- ♦ Charge air pipe Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#) .
- ♦ Charge air pipe Superb II  
⇒ [“2.2 Summary of components - Charge air cooler Superb II”, page 256](#) .
- ♦ Charge air pipe Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”, page 257](#) .

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## 1.6 Removing and installing vibration damper

### Removing

- Removing the V-ribbed belt:
- ♦ Vehicles with air conditioning system  
⇒ [“1.4 Removing and installing V-ribbed belt for vehicles with air conditioning system”, page 45](#) .
- ♦ Vehicles without air conditioning system  
⇒ [“1.3 Removing and installing V-ribbed belt for vehicles without air conditioning system”, page 45](#) .

- Loosen the screws -arrows- of the vibration damper, to do so hold the screw for the crankshaft timing belt sprocket using the ring spanner.
- Unscrew screws -arrows- and remove vibration damper.

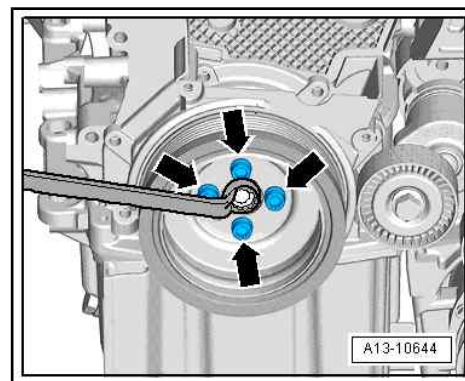
### Installing

Installation is carried out in the reverse order. When installing, observe the following:



#### Note

- ◆ Note the fitting position of the vibration damper ⇒ [page 44](#) .
- ◆ Replace screws of the vibration damper.



### Tightening torques

- ◆ Screws of the belt pulley  
⇒ [“1.2 Summary of components - V-ribbed belt drive for vehicles with air conditioning system”, page 43](#)

## 1.7 Removing and installing bracket for auxiliary units

### Special tools and workshop equipment required

- ◆ Support bracket - T30099- (Octavia II, Yeti)
- ◆ Base - T30099/1- (Octavia II, Yeti)
- ◆ Supporting device - MP9-200 (10-222A)- (Superb II)
- ◆ Wing plates - T10311- (Superb II)
- ◆ Adapter - MP9-200/3 (10-222A/3)-
- ◆ Hook - MP9-200/10 (10-222A/10)-
- ◆ Ring bolt - 3368-
- ◆ Collar nut M10

### Removing

- Remove the generator ⇒ Electrical System; Rep. gr. 27 .
- Remove high pressure pump  
⇒ [“2.8 Removing and installing the high pressure pump”, page 287](#) .



#### WARNING

**Do not open the refrigerant circuit of the air conditioning system.**

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#### Note

*In order to avoid damage to the AC compressor as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.*

- Remove the AC compressor from the bracket for auxiliary units and tie up to the lock carrier.
- Remove plenum chamber cover ⇒ Body Work; Rep. gr. 66 .





## For the vehicles Octavia II, Yeti

- Insert the supporting device - T30099- with the base - T30099/1- and the adapter - MP9-200/3- and attach the spindle -B-.

## For the vehicles Superb II

- Insert the -A-wing plate on the right vehicle side - T10311- in the -direction of the arrow- up to the stop. When doing this, the arrow -R- on the wing plate - T10311- points to the rear.
- Also insert the wing plate - T10311- on the left vehicle side -B- in the -direction of the arrow- up to the stop. When doing this, the arrow -L- on the wing plate - T10311- points to the rear.



### Note

*The wing plates -T10311- ensure that the wings do not get damaged through the weight of the engine/gearbox unit.*

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- Install supporting device - MP9-200 (10-222A)- with adapters - MP9-200/3 (10-222A/3)- and support engine/gearbox assembly in fitting position.

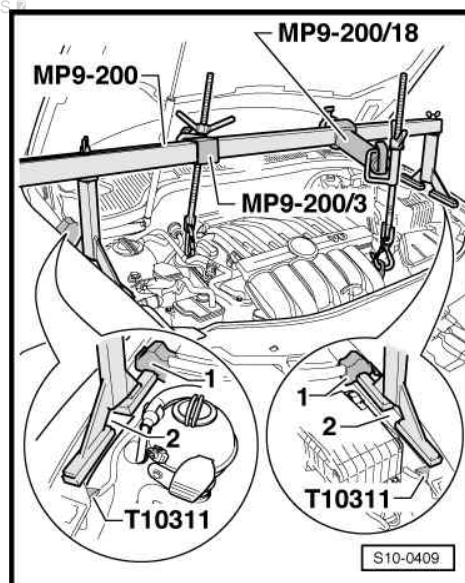
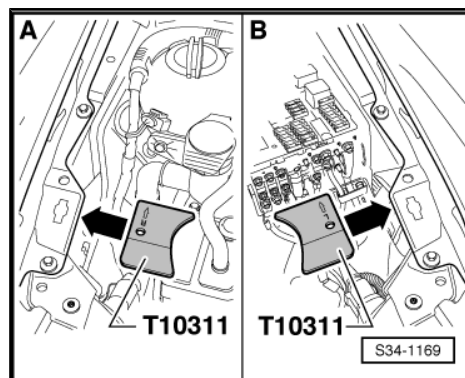
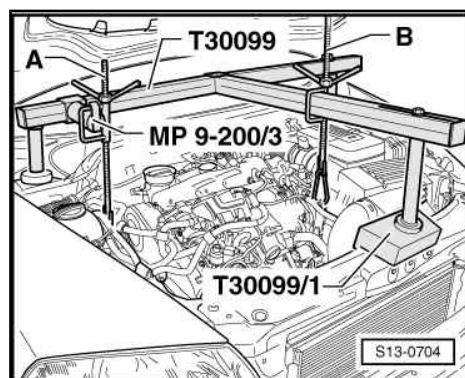
## Continued for all vehicles



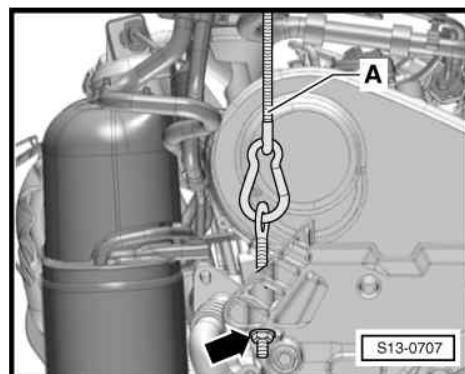
### WARNING

*Risk of accident due to loosened screwed connection.*

- ♦ *The collar nut must be screwed in by at least 6 turns so that the ring bolt - 3368- is held securely.*



- Secure the ring bolt - 3368- to the engine support with the collar nut M10 or the nut with the washer -arrow-.
- Hook spindle -A- onto ring bolt - 3368- .
- Uniformly pre-tension the engine with both spindles, but do not raise.



- Release screws -1- and -2-, remove connecting stud.
- Release screws -3...6- and remove engine mounting.

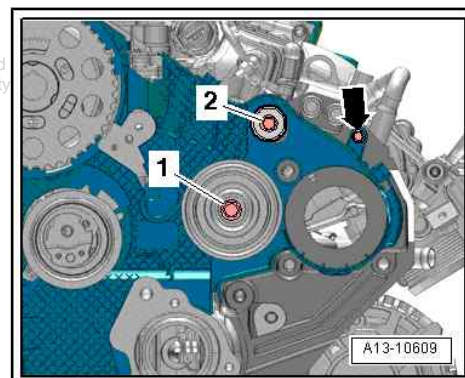
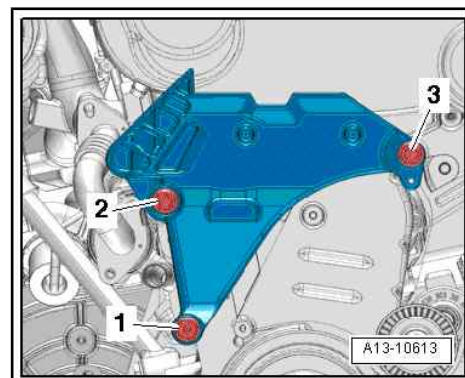
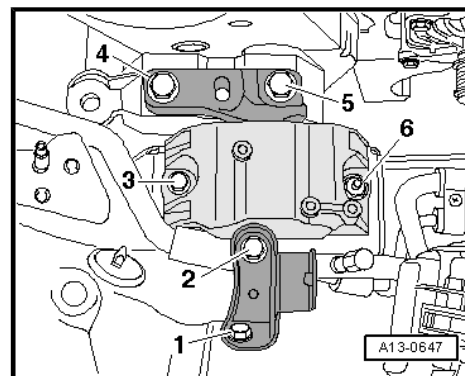
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- Unscrew screw -3- at the engine support.



- Unscrew plug -arrow-.

- Release screws -1- and -2- and remove toothed belt camshaft drives.





- Release screws -1...6- and remove bracket for auxiliary units.

### Installing

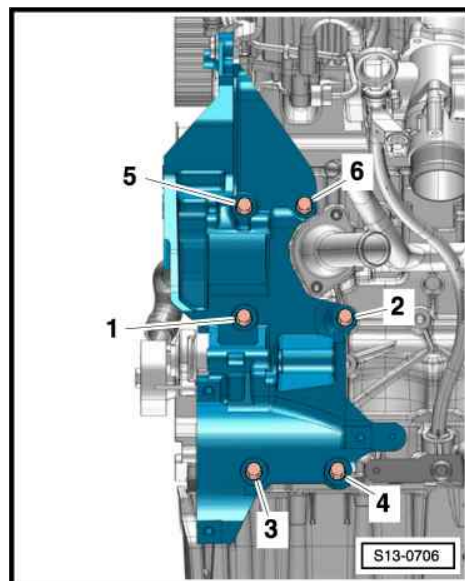
Assembly is carried out in the reverse order. When installing, observe the following:



### Note

*Replace screws which have been tightened to a torquing angle.*

- If no dowel sleeves are present on the top right between the bracket for auxiliary units and the cylinder block, insert dowel sleeves.
- Tighten the screws for the bracket for auxiliary units  
⇒ [page 45](#) .
- Install engine support and engine mount  
⇒ [“1.6 Assembly overview - assembly mountings”, page 29](#) .
- Install high pressure pump  
⇒ [“2.8 Removing and installing the high pressure pump”, page 287](#) .
- Install the toothed belt  
⇒ [“1.9.2 Installing \(set the timing\)”, page 59](#) .
- Install generator ⇒ Electrical System; Rep. gr. 27 .
- Install AC compressor at the bracket for auxiliary units  
⇒ [“1.2 Summary of components - V-ribbed belt drive for vehicles with air conditioning system”, page 43](#) .



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## 1.8 Assembly overview - toothed belt drive

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## 1 - Toothed belt

- ☐ before removing mark running direction
- ☐ check for wear
- ☐ do not kink
- ☐ Removing and installing  
⇒ ["1.9 Removing and installing toothed belt", page 55](#)



### Note

*If the toothed belt is replaced when carrying out engine repair (apart from regular change interval), it should be entered in the Service Schedule !*

## 2 - Nut

- ☐ 20 Nm

## 3 - Guide pulley

## 4 - Screw

- ☐ Replace after removal
- ☐ 50 Nm + 90°

## 5 - Nut

- ☐ 20 Nm + 45°

## 6 - Tensioning pulley

- ☐ for removing and installing, remove engine support  
⇒ ["1.9 Removing and installing engine support", page 35](#)

## 7 - Screw

- ☐ Replace after removal
- ☐ 20 Nm + 45°

## 8 - Camshaft sprocket

## 9 - Guide pulley

## 10 - Screw

- ☐ 20 Nm

## 11 - Screw

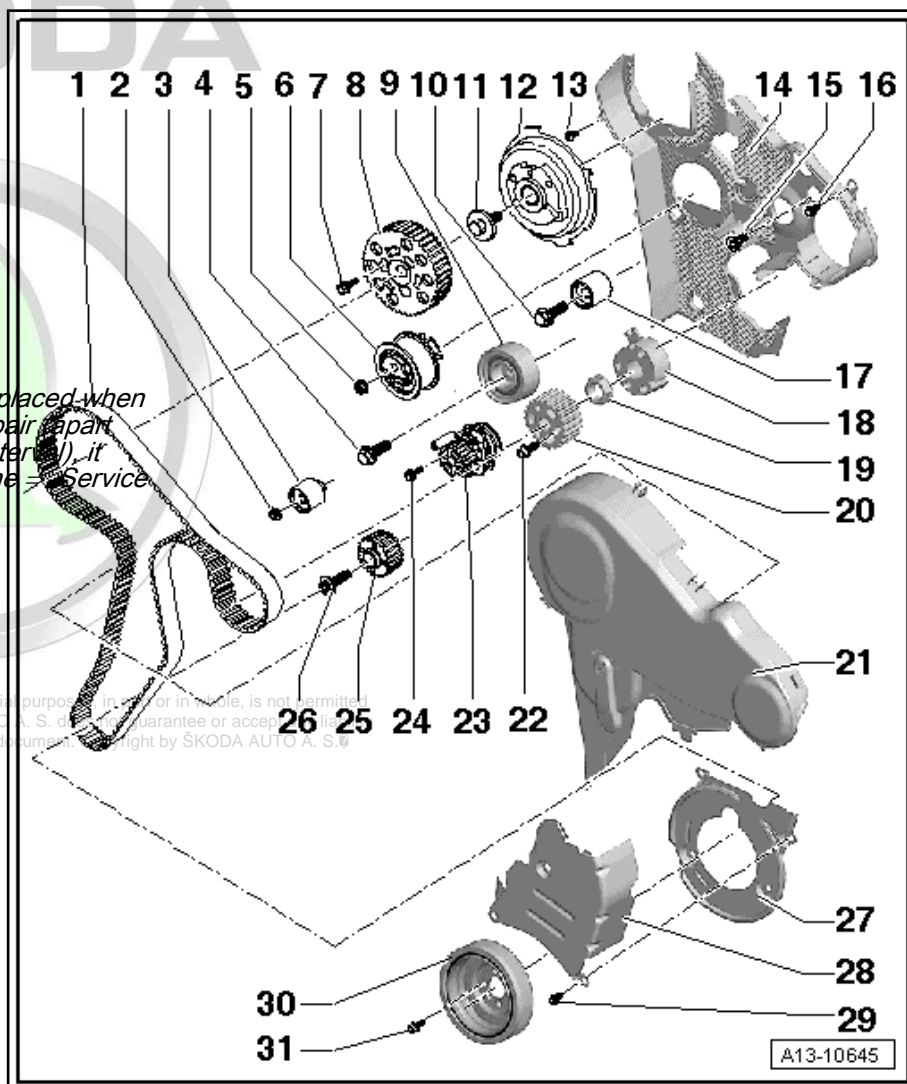
- ☐ to release and tighten use counterholder - T10051-
- ☐ 100 Nm

## 12 - Hub

- ☐ for camshaft
- ☐ with rotor
- ☐ to remove use extractor - T10052-
- ☐ Removing and installing ⇒ ["2.3 Removing and installing camshafts", page 120](#)

## 13 - Screw

- ☐ 9 Nm







#### 14 - Rear toothed belt guard

#### 15 - Screw

- ☐ Attach high pressure pump
- ☐ Replace after removal
- ☐ different lengths, tightening torques ⇒ ["2.1 Assembly overview - fuel system", page 271](#)

#### 16 - Screw

- ☐ 9 Nm

#### 17 - Guide pulley

#### 18 - Hub

- ☐ for high pressure pump
- ☐ to release and tighten use counterholder - T10051-
- ☐ to remove use extractor - T40064-
- ☐ Removing and installing ⇒ ["2.8 Removing and installing the high pressure pump", page 287](#)

#### 19 - Nut

- ☐ 95 Nm

#### 20 - Toothed belt gear on the high pressure pump

#### 21 - Toothed belt guard - top part

#### 22 - Screw

- ☐ Replace after removal
- ☐ 20 Nm

#### 23 - Coolant pump

- ☐ Removing and installing ⇒ ["2.3 Removing and installing coolant pump", page 167](#)

#### 24 - Screw

- ☐ 15 Nm

#### 25 - Crankshaft toothed belt sprocket

#### 26 - Screw

- ☐ Replace after removal
- ☐ to release and tighten use counterholder - T30004 (3415)-
- ☐ Neither oil nor grease thread or collar.
- ☐ tightening may occur in successive stages
- ☐ 180 Nm + 135°

#### 27 - Toothed belt guard - bottom part

#### 28 - Timing belt guard - middle part

#### 29 - Screw

- ☐ insert using locking agent - D 000 600 A2-
- ☐ 9 Nm

#### 30 - Vibration damper

- ☐ with vibration damper

#### 31 - Screw

- ☐ Replace after removal
- ☐ 10 Nm + 90°

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## 1.9 Removing and installing toothed belt

⇒ [“1.9.1 Removing”, page 55](#)

⇒ [“1.9.2 Installing \(set the timing\)”, page 59](#)

### Special tools and workshop equipment required

- ◆ Rig pin - 3359- (2x)
- ◆ camshaft clamp - T10050-
- ◆ Locking pin - T10060 A-
- ◆ Rig tool - T10265-
- ◆ Socket - T10385-
- ◆ Pliers for spring-type clips

### 1.9.1 Removing



#### Caution

*When undertaking all installation work, particularly in the engine compartment due to its cramped construction, please observe the following:*

- ◆ *Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.*
- ◆ *To avoid damage to lines/wiring, ensure sufficient clearance to all moving or hot components.*

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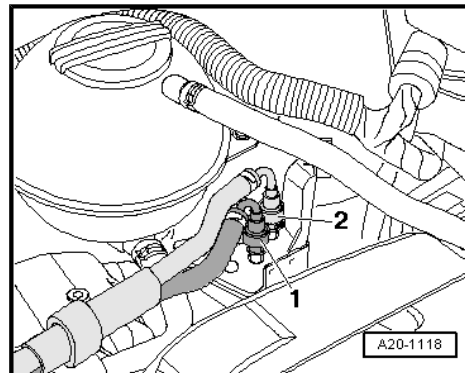


#### Note

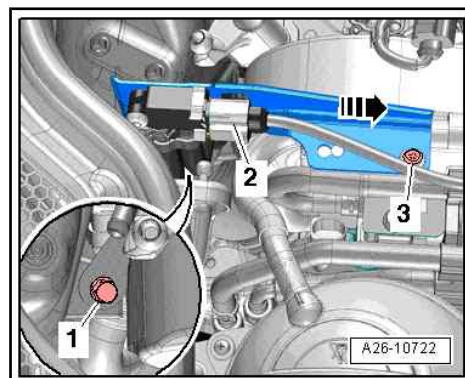
- ◆ *Safety precautions when working on the fuel supply system*  
⇒ [“2.3 Safety precautions when working on fuel supply system”, page 3](#) .
- ◆ *Observe rules for cleanliness*  
⇒ [“2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system”, page 4](#) .
- ◆ *The engine support does not have to be removed in order to remove the camshaft sprocket.*
- Put the shift lever into neutral position or the selector lever into position “N” in order to turn the crankshaft.
- Switch off ignition and pull out ignition key.
- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .



- Detach fuel feed line -2- and fuel return-flow line -1-, to do so press in securing ring. Unlock the quick coupling and disconnect ➔ **“2.9 Separating push-on couplings”, page 216** .



- Disconnect plug connection -2- at exhaust gas pressure sensor 1 - G450- .
- Screw out screw -3- and remove bracket with exhaust gas pressure sensor 1 - G450- from the bracket for the additional fuel pump in -direction of arrow-.
- Place the bracket with the exhaust gas pressure sensor 1 - G450- to the rear.



### Caution

#### **Risk of damage!**

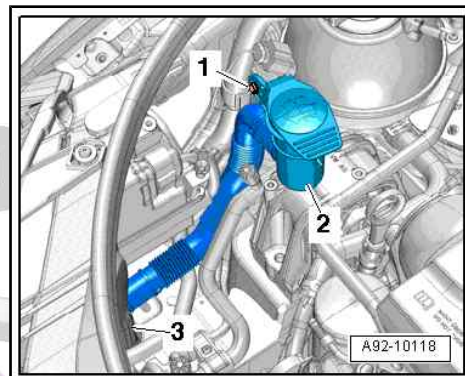
- ♦ *The exhaust gas pressure sensor 1 - G450- is very sensitive and must therefore not touch somewhere when laying it down with the bracket.*

- Unscrew bolt -1-.
- Push the filler tube with the filler neck -2- for the washer-fluid reservoir to the side.

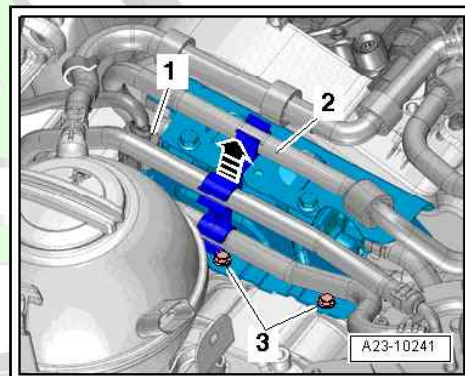


### Note

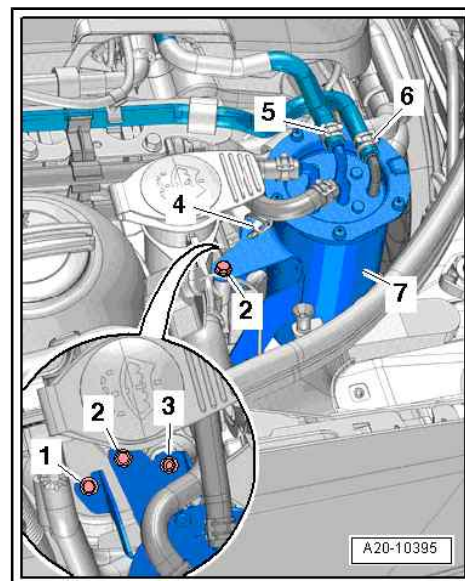
*For reasons of clarity the fuel filter is not shown.*



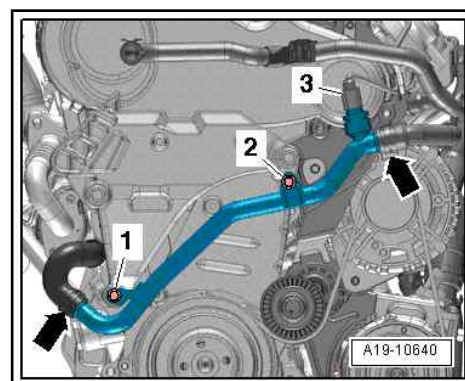
- Unhook the fuel hose -2- from the bracket.
- Remove the bracket for the fuel lines upwards -arrow- and lay to the side.
- Disconnect plug -1- at the additional fuel pump - V393- .
- Unscrew screws -3-.



- Release screw -1- by two turns.
- Release screw -2- and nut -3-.
- Unclip bracket -4- for coolant line at fuel filter.
- Lay the compensation bottle with the hoses connected and the fuel filter with the hoses connected -5- and -6- onto the engine.



- Disconnect plug -3- at the coolant temperature sender at radiator outlet - G83- .
- Unscrew nut -1- and screw -2-.
- Press the right coolant pipe with the hoses connected -arrows- to the side.

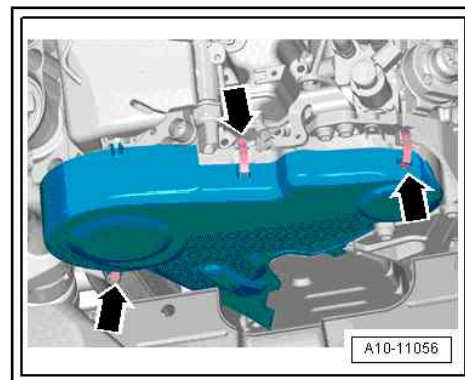


- Loosen holding clamps -arrows- and remove top part of toothed belt guard.
- Remove vibration damper  
⇒ [“1.6 Removing and installing vibration damper”, page 48](#) .



**Note**

*Do not lock tensioning element for V-ribbed belt.*

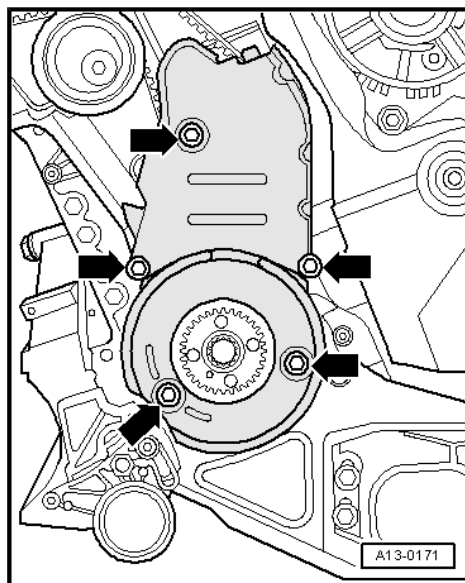


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- Unscrew screws -arrows-.
- Remove toothed belt guard-bottom part and -middle part.

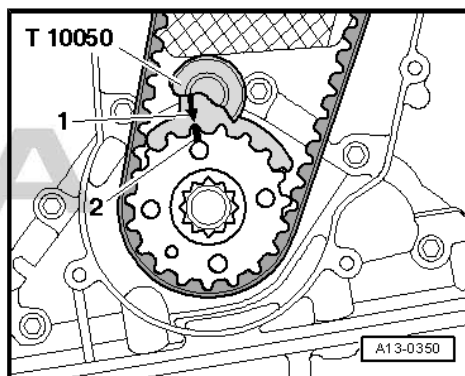


- Rotate the crankshaft on TDC in direction of rotation of the engine, interlock the crankshaft - toothed belt sprocket with the crankshaft arrester - T10050-. To do so, insert crankshaft arrester from the front side of the toothed belt sprocket into the teeth. The tooth segment of the camshaft sprocket must be at the »12 o'clock« position. If this is not the case, turn the crankshaft 360°.

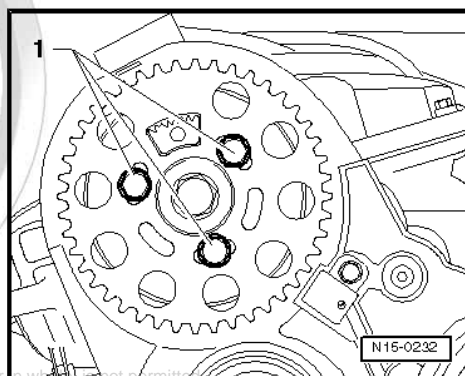


**Note**

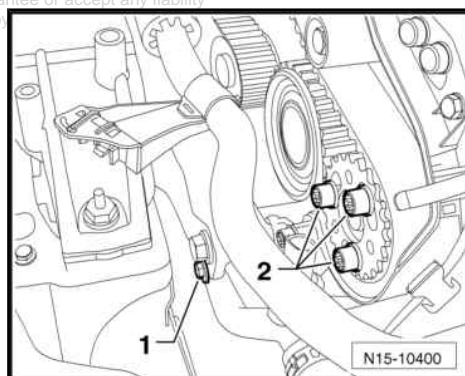
*The markings on the crankshaft - toothed belt sprocket -2- and on the crankshaft arrester - T10050- -1- must be aligned. While doing so, the stud of the crankshaft arrester - T10050- must engage in the hole of the sealing flange.*



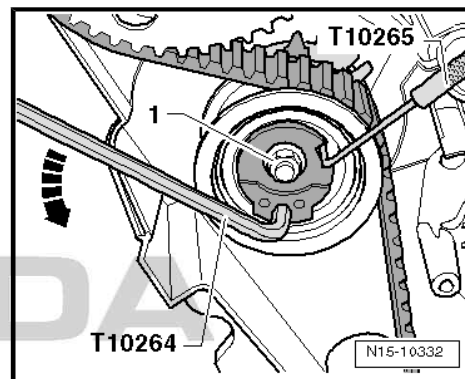
- Successively release screws -1- for camshaft sprocket, replace screws and do not fully screw in the new screws.



- Successively release screws -2- for toothed belt gear on the high pressure pump, replace screws and do not fully screw in the new screws.



- Loosen nut -1- for tensioning pulley.
- Turn the eccentric of the tensioning pulley with the offset screwdriver - T10264- in -direction of arrow- (anti-clockwise) until the tensioner pulley can be interlocked with the extractor - T10265- .



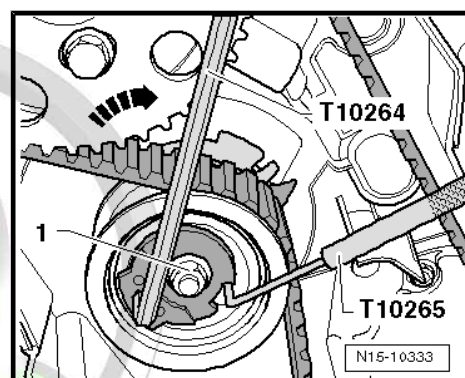
- Afterwards, turn the eccentric of the tensioning pulley with the offset screwdriver - T10264- in -direction of arrow- up to the stop and tighten nut -1- by hand.



#### Caution

**Risk of damage through reversing the rotation direction of an already used toothed belt.**

- ◆ **If the toothed belt is re-installed, mark the direction of rotation with chalk or a felt-tip pen before removing it.**



- First of all remove the toothed belt from the large guide pulley and then from the remaining toothed belt gears.

## 1.9.2 Installing (set the timing)

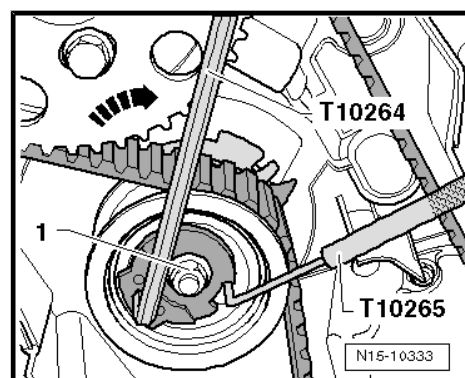


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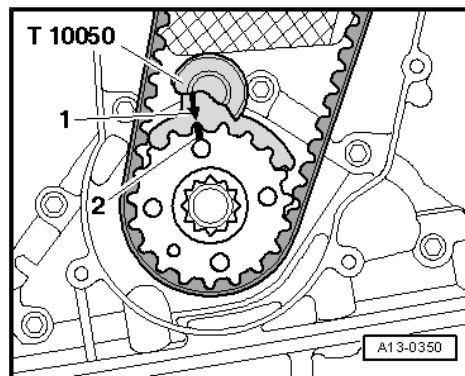
- ◆ **Adjusting work on the timing belt must only be performed on a cold engine, as the position of the pointer at the tensioning element is temperature dependent.**
- ◆ **If it is intended to replace the tensioning pulley, the engine support must be removed**  
⇒ **"1.9 Removing and installing engine support", page 35 .**

#### Conditions



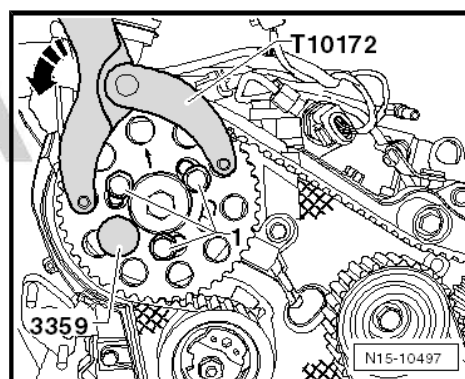


- Tensioning pulley locked with rig tool - T10265- and fixed with nut up to right stop.
- Interlock crankshaft with crankshaft arrester - T10050- .
- The screws for the camshaft sprocket and the toothed belt gear on the high pressure pump are replaced and loosely tightened. It must still be possible to just turn the toothed belt gears, however they must not hang loose.

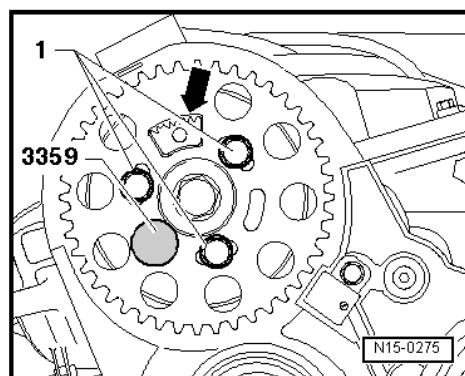


### Note

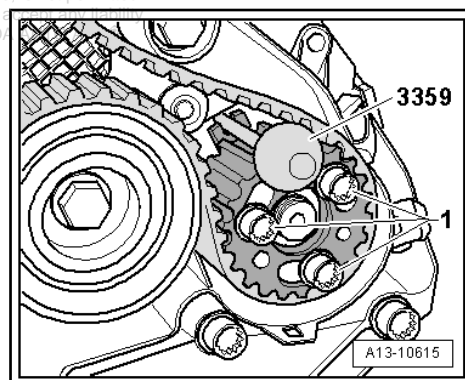
*If necessary, turn the hub of the camshaft using the counterholder - T10172- with pin - T10172/4- until it can be locked. To do so tighten at least one fixing screw -1- by hand.*



- Lock the hub of the camshaft with the rig pin for injection pump - 3359- . To do so, insert rig pin through the open elongated hole in the cylinder head bore.
- Loosen again the screws which were tightened by hand.



- Lock the hub of the high pressure pump with the rig pin for injection pump - 3359- . To do so, insert the rig pin into the hole of the timing belt gear from the outside.





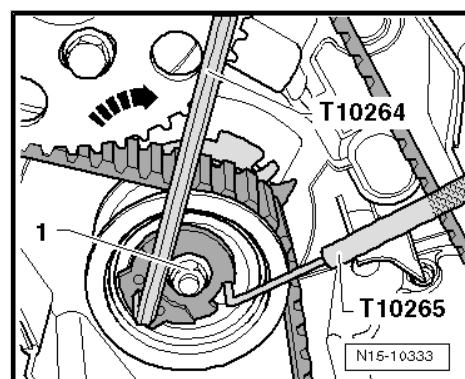
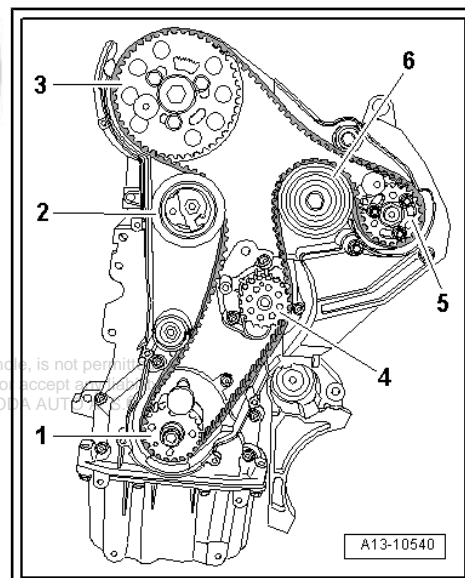
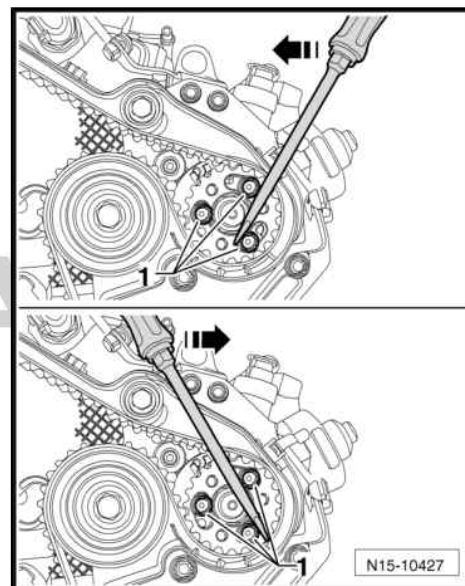
# Note

*If necessary, use a screwdriver to turn the hub of the high pressure pump at the screw heads -1- until the hub can be locked with the rig pin.*

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- Turn the camshaft sprocket -3- and the toothed belt sprocket on the high pressure pump -5- clockwise in the elongated holes as far as the stop.
- Fit the toothed belt in the following order:
  - 1 - Crankshaft toothed belt sprocket
  - 2 - Tensioning pulley
  - 3 - Camshaft sprocket
  - 4 - Timing belt gear on the coolant pump
  - 5 - Toothed belt gear on the high pressure pump
  - 6 - Guide pulley

- Loosen nut -1- for tensioning pulley and remove rig tool - T10265- .



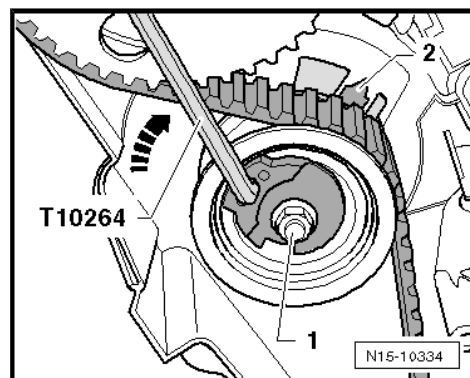
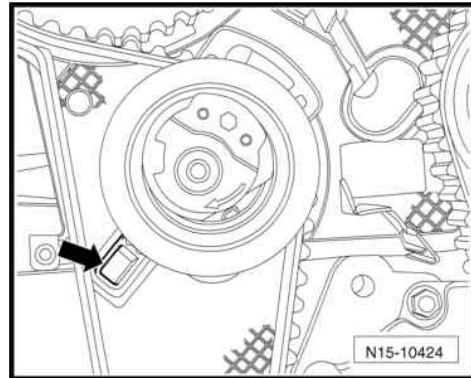




## Note

Pay attention to correct fitting of the tensioning pulley in the rear timing belt cover -arrow-.

- Turn the eccentric of the tensioning pulley with the offset screwdriver - T10264- clockwise -arrow- until the pointer -2- is in the centre of the base plate in front of the gap.
- The nut -1- must not turn along.
- Hold tensioning pulley in this position and tighten nut -1- to the specified tightening torque.



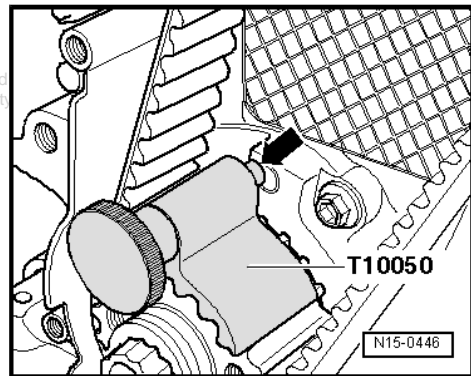
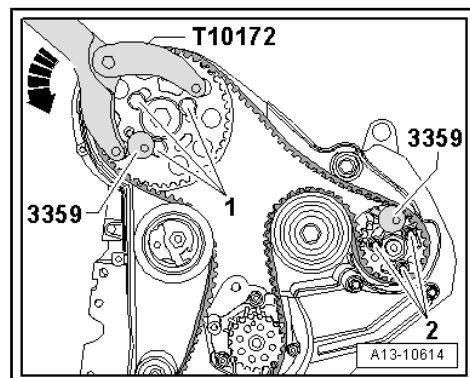
- Fit counterholder - T10172- with adapters - T10172/4- onto camshaft sprocket.
- Push the counterholder in -direction of arrow- and keep it pre-tensioned.
- First of all tighten the screws -1- for the toothed belt pulley of the camshaft and the screws -2- for the toothed belt pulley of the high pressure pump in this position to 20 Nm.

The screws for camshaft sprocket must be further turned according to the setting of the timing ⇒ [page 64](#) .

- Remove rig pins - 3359- and crankshaft arrester - T10050- .

## Checking valve timing

- Turn the crankshaft at the screw for timing belt gear 2 turns in the direction of running of the engine until the crankshaft is positioned shortly before "TDC".
- Position again the crankshaft arrester - T10050- on the crankshaft timing belt sprocket.
- Turn the crankshaft in the direction of rotation of the engine until the bolt -arrow- of the crankshaft arrester engages during this rotary movement in the sealing flange.





## Note

*The removal of the crankshaft and camshaft is limited in the following test. The rig point of the hub of the high pressure pump is always difficult to find again. A slight difference -arrow- does not influence the engine running.*

## Conditions

- The hub of the camshaft must be locked with the rig pin for diesel injection pump - 3359- .
- The pointer of the tensioning pulley -2- must be in the area -a- of the base plate -1-.

If the conditions are not fulfilled:

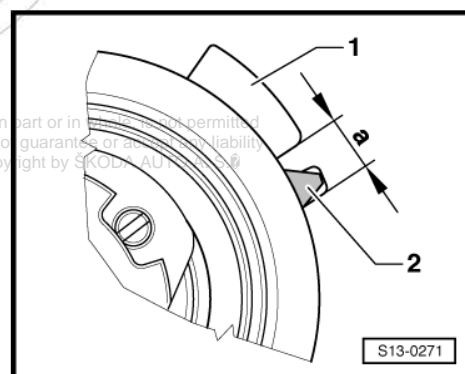
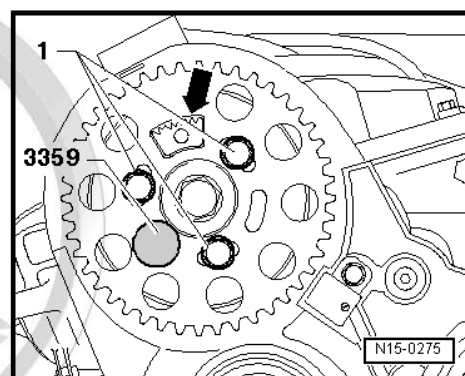
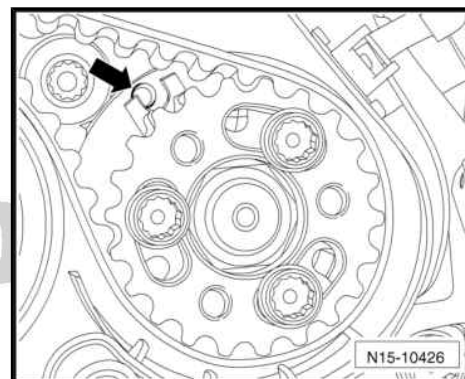
- Correct timing ⇒ [page 63](#) .

If the conditions are fulfilled:

Continued if the timing is correctly set ⇒ [page 64](#) .

## Correct timing

- Push the crankshaft arrester - T10050- until its locking bolt pushes out of the hole in the sealing flange.
- Turn out the crankshaft opposite to the running direction of the engine to slightly before "TDC".
- Now slowly turn the crankshaft in the running direction of the engine, until the hub of the camshaft can be locked with the rig pin for the injection pump - 3359- .
- Slacken the fixing screws for the camshaft sprocket when the hub of the camshaft sprocket is locked.
- Check the position of the bolt of the crankshaft arrester - T10050- to the hole in the sealing flange:





If the bolt of the crankshaft arrester - T10050- is positioned to the left of the hole:

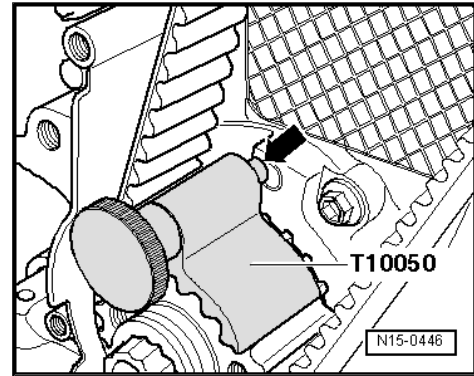
- Rotate the crankshaft in direction of rotation of engine until the bolt of the crankshaft arrester engages in the hole of the sealing flange.
- Tighten bolts of camshaft sprocket to 20 Nm.

The screws must be further turned according to the setting of the timing ➔ [page 64](#) .

If the bolt of the crankshaft arrester - T10050- is positioned to the right behind the hole:

- First of all turn the crankshaft slightly against the direction of rotation of engine until the bolt is positioned to the left in front of the hole.
- Slowly turn the crankshaft in the direction of rotation of the engine until the bolt of the crankshaft arrester - T10050- engages into the hole in the sealing flange.
- Pre-tighten the fixing screws for the camshaft sprocket to 20 Nm.

The screws must be further turned according to the setting of the timing ➔ [page 64](#) .



#### Procedure if the timing is correctly set

- Remove rig pin - 3359- and crankshaft arrester - T10050- .
- Once again test timing ➔ [page 62](#) .

If the hub of the camshaft sprocket can now be secured:

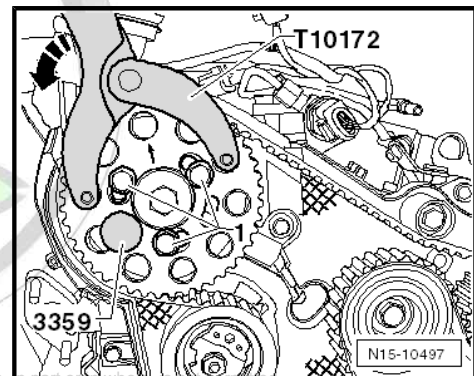
- Tighten fixing screws for camshaft sprocket further 45° with a rigid wrench. Hold the camshaft sprocket with the counter-holder - T10172- with pin - T10172/4- .

#### Further installation

Further installation occurs in reverse order to removal.

#### Tightening torques

- ◆ Tensioning pulley nut  
➔ ["1.8 Assembly overview - toothed belt drive", page 52](#) .



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## 2 Sealing flanges and flywheel

⇒ [“2.1 Summary of components - sealing flange on the belt pulley side”, page 65](#)

⇒ [“2.2 Replacing crankshaft sealing ring on the belt pulley side”, page 66](#)

⇒ [“2.3 Removing and installing the sealing flange on the belt pulley side”, page 67](#)

⇒ [“2.4 Summary of components - gearbox side summary of components and flywheel”, page 69](#)

⇒ [“2.5 Replace sealing flange on the gearbox side”, page 71](#)

⇒ [“2.6 Removing and installing the two-mass flywheel”, page 77](#)

### 2.1 Summary of components - sealing flange on the belt pulley side

#### 1 - Screw

- ☐ Replace after removal
- ☐ to release and tighten use counterholder - T30004 (3415)-
- ☐ Neither oil nor grease thread or collar.
- ☐ tightening may occur in successive stages
- ☐ 180 Nm + 135°

#### 2 - Crankshaft toothed belt sprocket

#### 3 - Sealing ring

- ☐ Replace  
⇒ [“2.2 Replacing crankshaft sealing ring on the belt pulley side”, page 66](#)
- ☐ do not oil or grease

#### 4 - Sealing flange on the belt pulley side

- ☐ must be positioned on dowel pins
- ☐ Removing and installing  
⇒ [“2.3 Removing and installing the sealing flange on the belt pulley side”, page 67](#)

#### 5 - Cylinder block

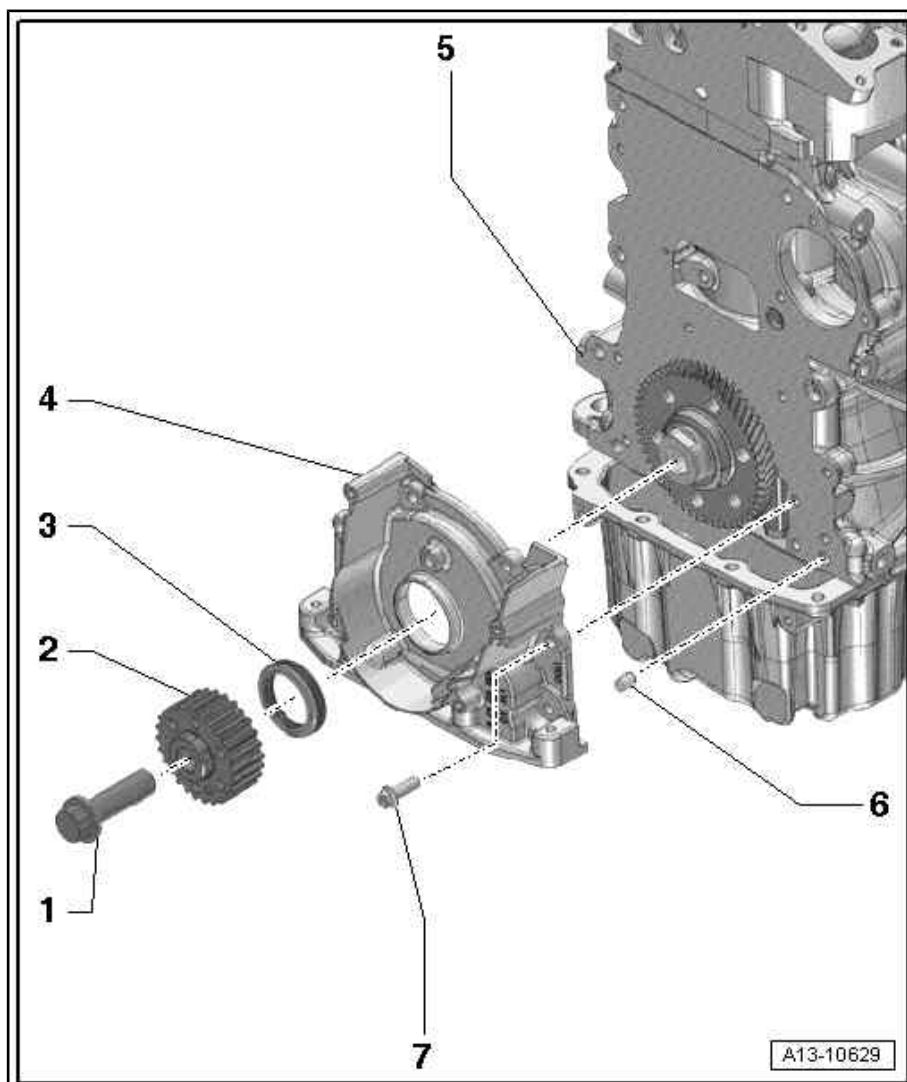
- ☐ After replacing, fill with fresh coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#)

#### 6 - Fit pin

- ☐ 2 pieces

#### 7 - Screw

- ☐ Replace after removal
- ☐ 15 Nm



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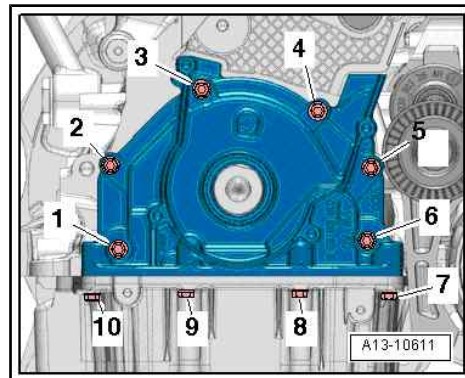




### Sealing flange on the belt pulley side - tightening torque and tightening order

- Tighten screws in 3 steps in the given sequence:

Stage	Bolts	Tightening torque
1.	-1 ... 10-	by hand as far as the stop
2.	-1 ... 6-	crosswise in steps up to 15 Nm
3.	-7 ... 10-	15 Nm



## 2.2 Replacing crankshaft sealing ring on the belt pulley side

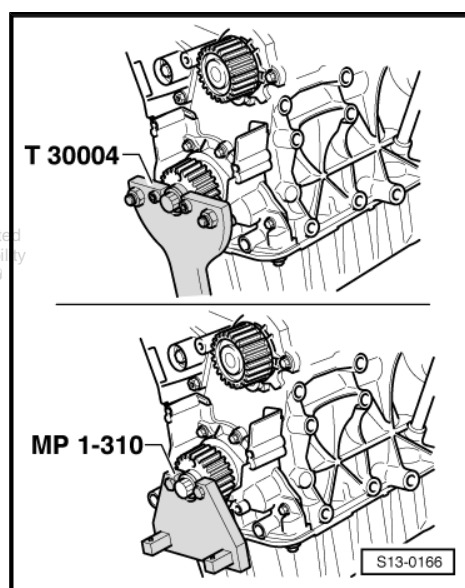
### Special tools and workshop equipment required

- ♦ Counterholder - T30004 (3415)- or counterholder for toothed belt sprocket - MP1-310 (3099)-
- ♦ Sealing ring extractor - MP1-226 (3203)-
- ♦ Assembly tool - T10053-

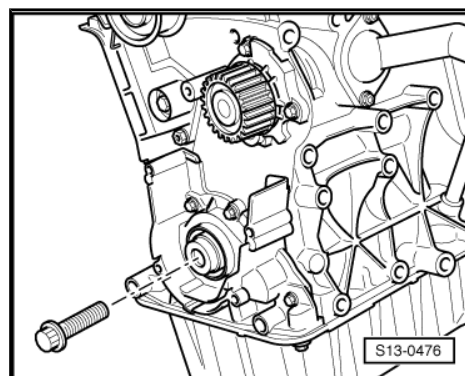
### Removing

- Engine installed.
- Remove toothed belt  
⇒ [“1.9 Removing and installing toothed belt”, page 55](#) .
- Remove crankshaft - toothed belt sprocket, to this end lock toothed belt sprocket with counterholder - T30004- or counterholder - MP1-310- .

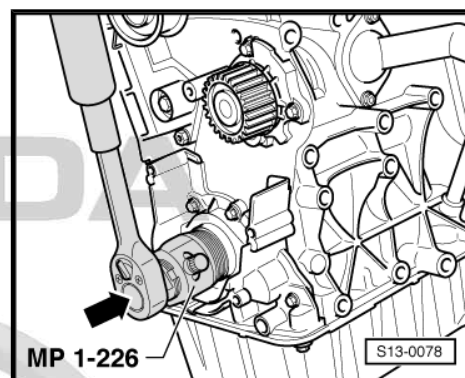
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- To guide the gasket ring extractor - MP1-226- screw the central screw for the crankshaft toothed belt sprocket fully into the crankshaft by hand.



- Unscrew inner part of the gasket ring extractor - MP1-226- nine turns (approx. 3 mm) out of the outer part and lock with knurled screw.
- Oil the thread head of the gasket ring extractor, position and forcibly screw into the gasket ring as far as possible.
- Release knurled screw and turn the inner side against the crankshaft until the gasket ring is pulled out.
- Clamp gasket ring extractor on the surfaces provided in a vice and remove gasket ring with pliers.
- Clean the contact and sealing surface.



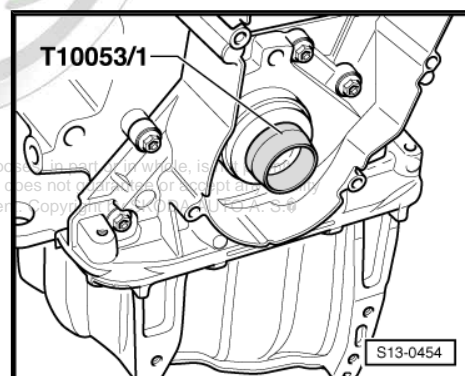
### Installing



#### Note

*Do not oil the sealing lip and the outer surface of the gasket ring before the pressing in procedure.*

- Remove oil residue on the crankshaft bearing pin with a clean cloth.
- Insert bushing - T10053/1- on the crankshaft stub.
- Slide gasket ring over the guide bushing.

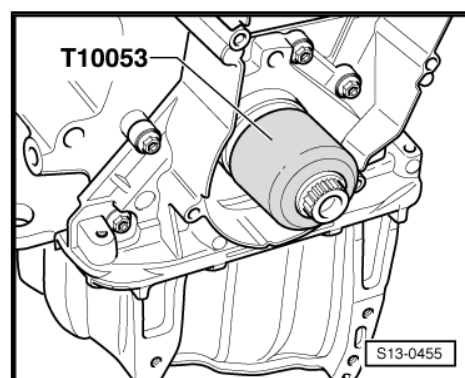


- Press in the gasket ring flush with the central screw for the crankshaft toothed belt sprocket and with the pressure bushing of the assembly device - T10053- .



#### Note

- ◆ *There must not be any oil present on contact surface between toothed belt sprocket and crankshaft.*
- ◆ *Replace central screw for crankshaft toothed belt sprocket.*
- ◆ *Do not oil central screw for crankshaft toothed belt sprocket.*
- ◆ *Tighten central screw*  
*⇒ "1.8 Assembly overview - toothed belt drive", page 52 .*
- Install crankshaft - toothed belt sprocket, to this end lock toothed belt sprocket with counterholder - T30004- .
- Install the toothed belt  
*⇒ "1.9.2 Installing (set the timing)", page 59 .*



## 2.3 Removing and installing the sealing flange on the belt pulley side

Special tools and workshop equipment required



- ◆ Counterholder - T30004 (3415)- or counterholder for toothed belt sprocket - MP1-310 (3099)-
- ◆ Assembly tool - T10053-
- ◆ Protective goggles and gloves
- ◆ Sealant remover Gasket Stripper (stock code GST, stock item No. R 34402), manufacturer Retech s.r.o.
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Silicone sealant ⇒ ETKA - Electronic catalogue of original parts

## Removing

- Engine installed.
- Remove toothed belt  
⇒ [“1.9 Removing and installing toothed belt”, page 55](#) .
- Remove crankshaft - toothed belt sprocket, to this end lock toothed belt sprocket with counterholder - T30004- or counterholder - MP1-310- .
- Drain engine oil:
- ◆ Octavia II ⇒ Maintenance ; Booklet Octavia II .
- ◆ Yeti ⇒ Maintenance ; Booklet Yeti .
- ◆ Superb II ⇒ Maintenance ; Booklet Superb II .
- Removing the oil pan  
⇒ [“1.5 Removing and installing oil pan”, page 143](#) .
- Unscrew the fixing screws of the front sealing flange and remove sealing flange, if necessary release by applying slight blows with a rubber-headed hammer.
- Drive out the gasket ring from the removed sealing flange.

## Installing

Installation is carried out in the reverse order. When installing, observe the following:



### WARNING

***Wear protective gloves when working with sealant and grease remover!***

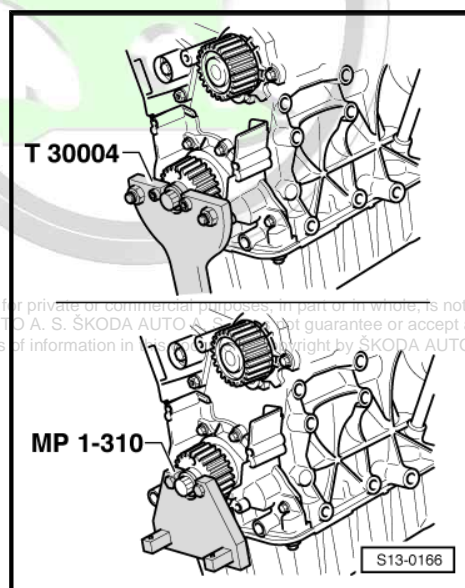
- Remove residual sealant from the sealing surfaces on sealing flange, cylinder block and on the oil pan with chemical sealant remover.
- Degrease the sealing surfaces.



### Note

*Pay attention to the use by date on the silicone sealant.*

- Cut off nozzle tube at the front marking (Ø of nozzle approx. 3 mm).

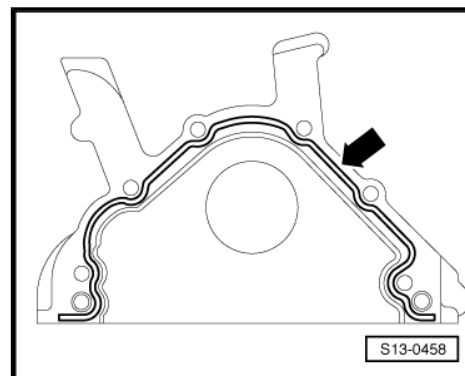


- Apply silicone sealant bead -arrow- to the clean sealing surface of the sealing flange, as shown.
- Thickness of sealant bead -arrow-: 2...3 mm



#### Note

- ◆ *The sealant bead must not be thicker than 3 mm otherwise excess sealant may get into the oil pan and clog the strainer in the oil suction pipe.*
- ◆ *The sealing flange must be installed within 5 minutes after applying the silicone sealant.*
- ◆ *When installing the sealing flange with the gasket ring fitted place a guide sleeve - T10053/1- on the crankshaft journal.*



- Carefully push the sealing flange onto the fitted pins at the cylinder block and tighten new fixing bolts by hand as far as the stop.
- Tighten the screws of the sealing flange alternately and cross-wise to the specified tightening torque.
- Install oil sump  
⇒ ["1.5 Removing and installing oil pan", page 143](#) .
- Install the new gasket ring for the crankshaft on the belt pulley side  
⇒ ["2.2 Replacing crankshaft sealing ring on the belt pulley side", page 66](#) .
- Install the toothed belt  
⇒ ["1.9.2 Installing \(set the timing\)", page 59](#) .
- Top up with engine oil and check the oil level:
- ◆ Octavia II ⇒ Maintenance ; Booklet Octavia II .
- ◆ Yeti ⇒ Maintenance ; Booklet Yeti .
- ◆ Superb II ⇒ Maintenance ; Booklet Superb II .

#### Tightening torques

- ◆ Screws for sealing flange  
⇒ ["2.1 Summary of components - sealing flange on the belt pulley side", page 65](#)

## 2.4 Summary of components - gearbox side summary of components and flywheel



#### Note

*Repairs to the clutch ⇒ Gearbox; Rep. gr. 30 .*

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### 1 - Screw

- ☐ Replace after removal
- ☐ 60 Nm + 90°

### 2 - The two-mass flywheel

- ☐ Removing and installing  
⇒ ["2.6 Removing and installing the two-mass flywheel", page 77](#)
- ☐ assembly is only possible in one position through offset holes

### 3 - Rotor

- ☐ Speed sensor - G28-
- ☐ Removing and installing  
⇒ ["2.5 Replace sealing flange on the gearbox side", page 71](#)

### 4 - Speed sensor - G28-

- ☐ Removing and installing  
⇒ ["1.3 Removing and installing the engine speed sender G28", page 269](#)
- ☐ Check VAS/ODIS ⇒ Vehicle diagnostic tester

### 5 - Screw

- ☐ 5 Nm

### 6 - Fit pin

- ☐ 2 pieces

### 7 - Intermediate plate

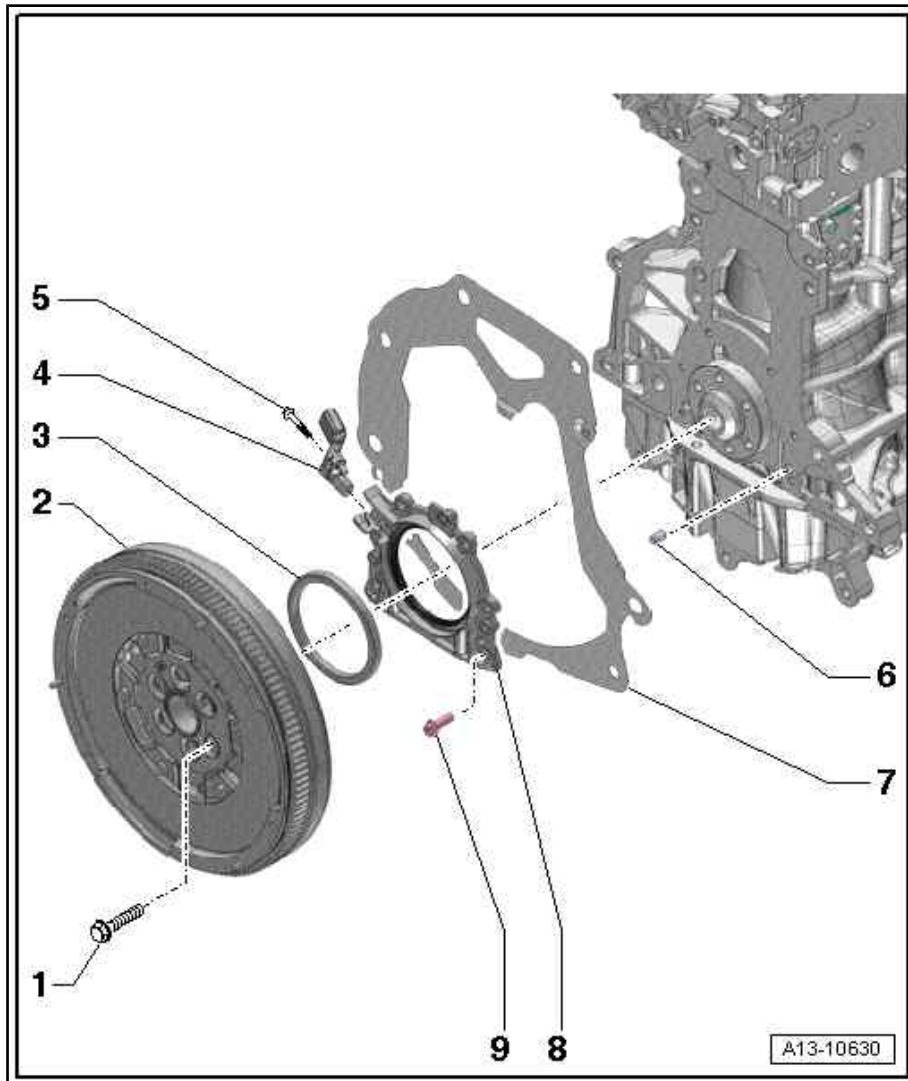
- ☐ do not damage/bend during assembly work
- ☐ installing ⇒ [page 70](#)

### 8 - Sealing flange on the gearbox side

- ☐ can only be replaced complete with sealing ring and rotor for engine speed sender - G28-
- ☐ Replace ⇒ ["2.5 Replace sealing flange on the gearbox side", page 71](#)

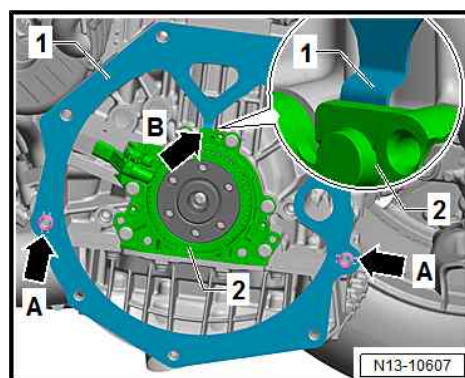
### 9 - Screw

- ☐ Replace after removal
- ☐ 15 Nm



### Installing intermediate plate

- Mount intermediate plate -1- on sealing flange -2- and push onto the dowel sleeves arrows -A-.



## 2.5 Replace sealing flange on the gearbox side

⇒ [“2.5.1 Removing”, page 71](#)

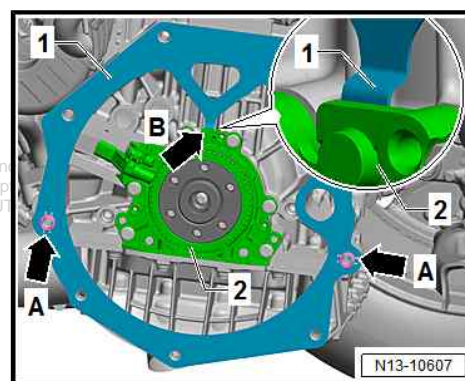
⇒ [“2.5.2 Installing”, page 72](#)

### Special tools and workshop equipment required

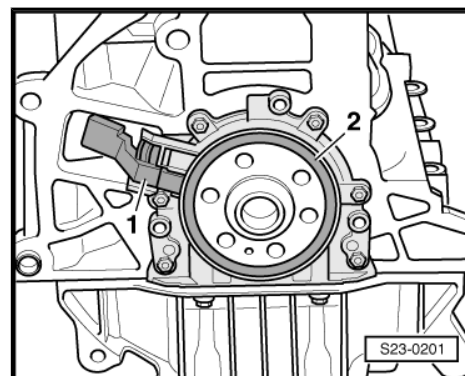
- ◆ Assembly tool - T10134-
- ◆ Depth gauges , e.g. -VAS 6082-
- ◆ Screw M6 x 35 (3x)
- ◆ Screw M7 x 35 (2x)

### 2.5.1 Removing

- Gearbox removed.
- Remove the two-mass flywheel  
⇒ [“2.6 Removing and installing the two-mass flywheel”, page 77](#) .
- Remove intermediate plate -1- from the dowel sleeves arrows -A- and detach from sealing flange -2- arrow -B-.
- Position crankshaft to TDC for cylinder 1  
⇒ [“1.9 Removing and installing toothed belt”, page 55](#) .
- Removing the oil pan  
⇒ [“1.5 Removing and installing oil pan”, page 143](#) .



- Remove engine speed sender - G28- -Pos. 1-.

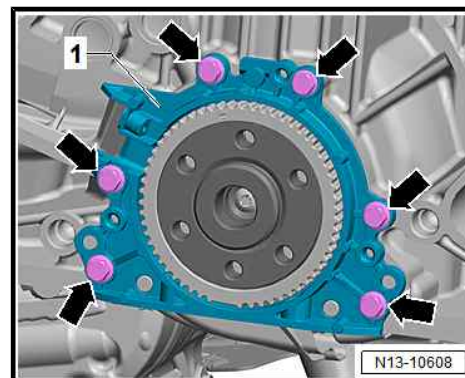


- Unscrew fixing screws -arrows- of the sealing flange -1-.



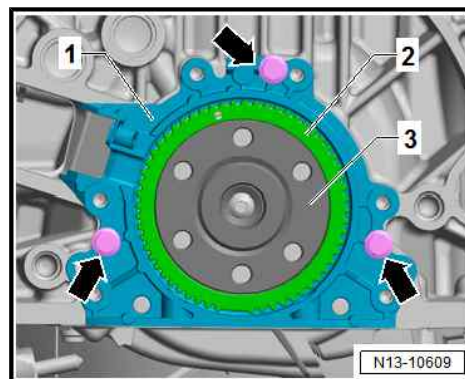
#### Note

Sealing flange and sender wheel are pressed together by three M6 x 35 mm screws of the cylinder block.





- Alternately screw 3 screws M6x35 -arrows- (max. 180° per screw) into the threaded holes of the sealing flange -1- and pull off the sealing flange together with the rotor -2- off the crankshaft -3-.

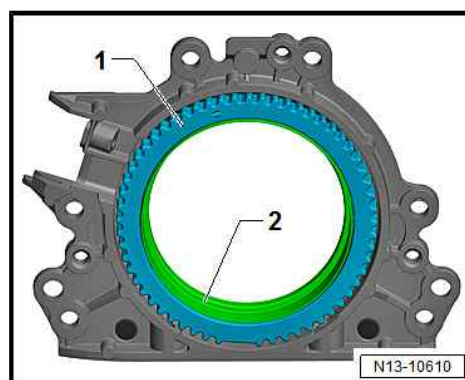


## 2.5.2 Installing



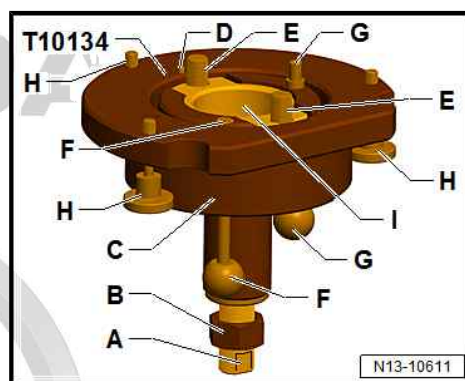
### Note

- ♦ The sealing flange with PTFE sealing ring is provided with sealing lip supporting ring -2-. This support ring serves as a fitting sleeve and must not be removed prior to installation.
- ♦ Do not separate or turn the sealing flange and rotor -1- after removing them from the spare part package.
- ♦ The rotor gets its fitting location by fixing by fixing to the positioning pin of the assembly tool - T10134- .
- ♦ Sealing flange and sealing ring form one unit and must only be renewed together with the transmitter wheel.
- ♦ The rotor has an elastomer layer on its sealing surface with the crankshaft. This layer must not be brought into contact with dirt or grease.
- ♦ The assembly tool - T10134- is given its fitting location to the crankshaft by means of a guide bolt, which is guided into the threaded bore of the crankshaft.



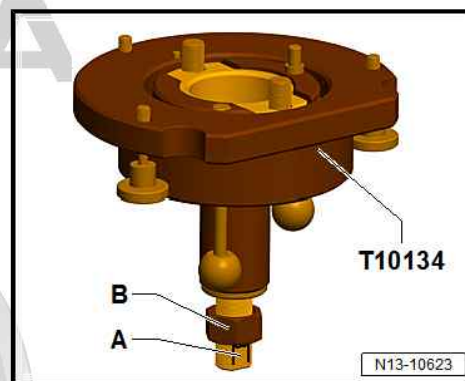
### Assembly tool - T10134-

- A - Clamping surface
- B - Hexagon nut
- C - Assembly housing
- D - Locating pin
- E - Allan screws (2 pieces)
- F - Guide bolts for petrol engines
- G - Guide bolts for diesel engines
- H - Knurled screws (3 pieces)
- I - Inner part

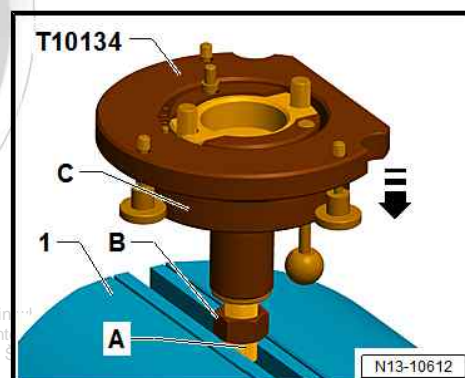


## Mounting sealing ring with rotor on assembly tool - T10134-

- Untwist nut -B- until just before it touches the clamping surface -A- of the threaded spindle.



- Grip assembly tool - T10134- at clamping surface -A- of the threaded spindle in a vice.
- Press assembly housing -C- downwards until it lies on hexagon nut -B-.
- Screw nut onto threaded spindle until inner part of assembly tool and assembly housing are at same height.

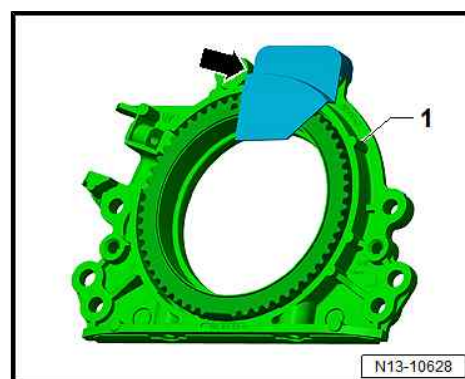


- Remove the securing clip -arrow- from the new sealing flange.

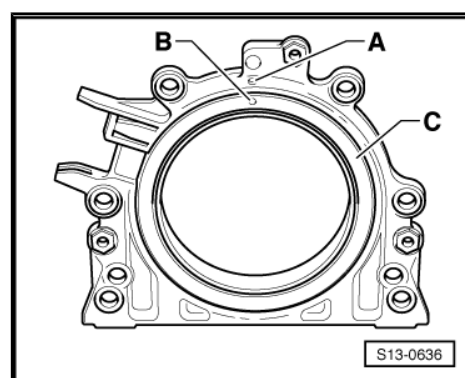


### Note

*Do not remove the rotor from the sealing flange or turn it.*



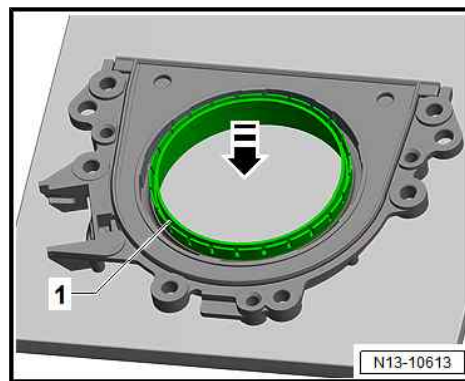
- The locating hole -B- on the sender wheel -C- must be flush with the marking -A- on the sealing flange.





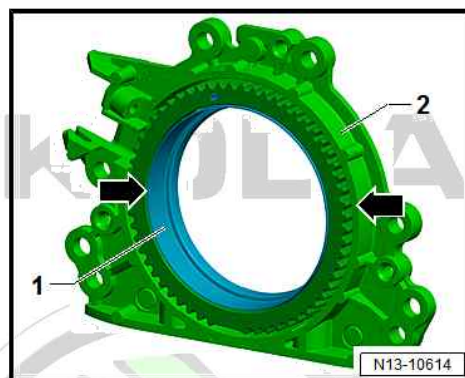


- Place sealing flange with front side facing down on a clean level surface.
- Press down sealing lip supporting ring -1- in -direction of arrow-, until it rests on the level surface.



**Note**

*Upper edge of sealing lip support ring -1- and front edge of sealing flange -2- must align -arrows-.*

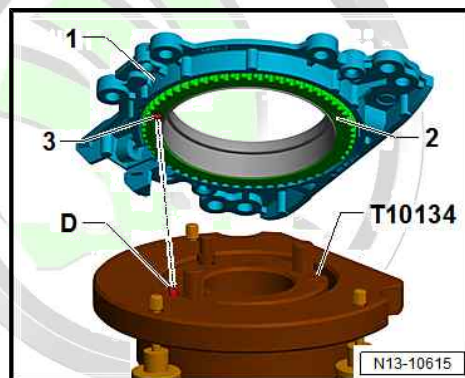


- Lay the sealing flange -1- with the front side on the assembly tool - T10134- so that the positioning pin -D- engages into the hole -3- of the rotor -2-.



**Note**

*Sealing flange must lie straight on the assembly tool.*

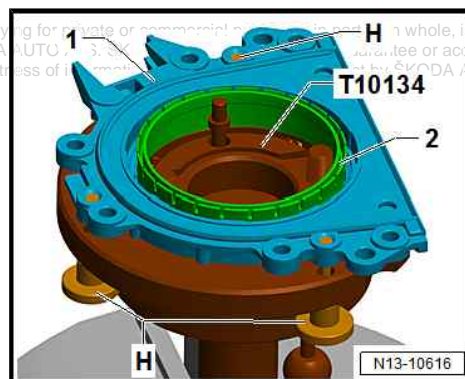


- Press on the sealing flange -1- and sealing lip supporting ring -2- by tightening the 3 knurled screws -H- onto the surface of the assembly tool - T10134- .



**Note**

- ♦ *This prevents locating pin from slipping out of sender wheel hole.*
- ♦ *When installing the sealing flange, ensure that the sender wheel remains fixed in the assembly device.*



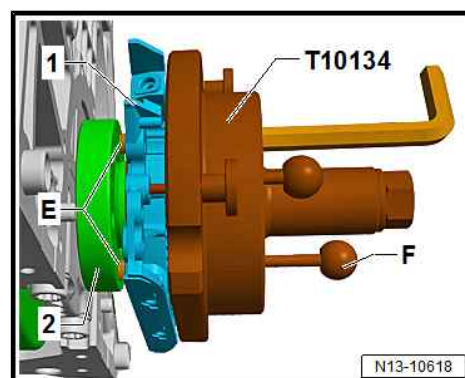
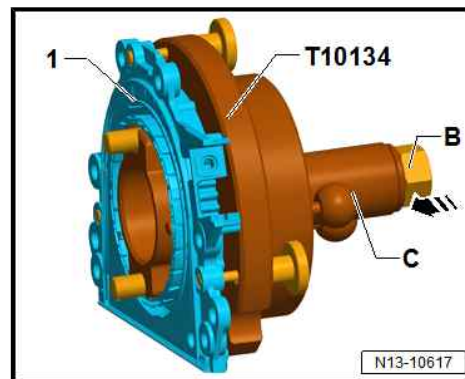
### Securing the assembly tool - T10134- with sealing flange on the crankshaft flange

- The crankshaft flange must be free of grease and oil.
- Crankshaft is at TDC for cylinder 1.
- Screw nut -B- on until it reaches end of threaded spindle.
- Press the threaded spindle of the assembly tool - T10134- in -direction of arrow- until the nut -B- rests against the assembly cup -C-.
- Align flat side of assembly housing to the cylinder block sealing surface on the oil sump side.
- Secure the assembly tool - T10134- and the sealing flange -1- with Allan screws -E- to the crankshaft flange.

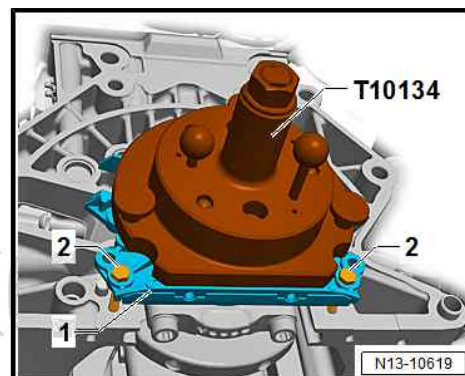


#### Note

Screw in Allan screws -E- into the crankshaft flange by approx. five thread turns.



- Screw in two screws M7 x 35 mm -2- by about 3 thread turns into the cylinder block to guide the sealing flange -1-.



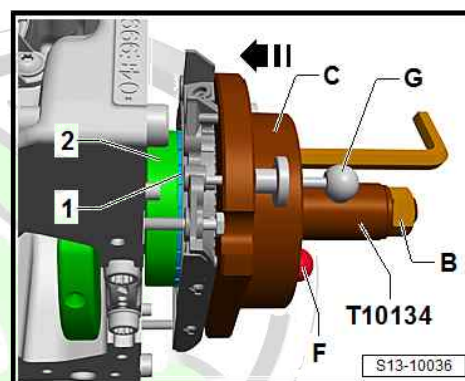
### Bolt assembly tool - T10134- onto crankshaft flange.

- Push the assembly cup -C- by hand in the -direction of the arrow- until the sealing lip supporting ring -1- rests on the crankshaft flange -2-.
- Push guide pin for diesel engines -G- into the hole in the crankshaft. This gives the rotor its final installation position.



#### Note

The guide pin for petrol engines -F- must not be inserted in threaded hole of crankshaft.



- Tighten the two Allan screws hand-tight.
- Screw nut -B- onto threaded spindle by hand until it lies against assembly housing -C-.



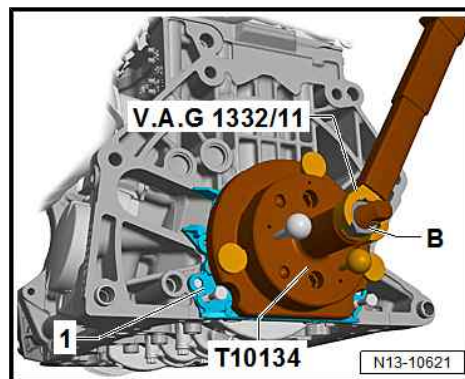
### Press sender wheel onto crankshaft flange using assembly tool - T10134-

- Tighten nuts -B- on the assembly tool - T10134- with torque wrench to 35 Nm.



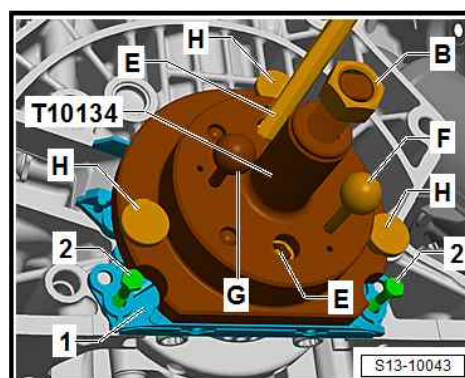
#### Note

*After tightening the nut to 35 mm there must still be a narrow air gap between the cylinder block and the sealing flange.*

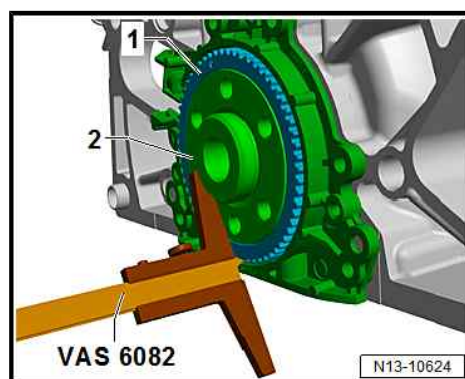


### Checking sender wheel installation position on crankshaft

- Screw nut -B- on until it reaches end of threaded spindle.
- Unscrew bolts -2- from the intake manifold.
- Unscrew the knurled screws -H- from the sealing flange.
- Unscrew the Allan screws -E- from the crankshaft flange.
- Remove assembly tool - T10134- .
- Remove sealing lip support ring.



- Place caliper gauge on crankshaft flange.



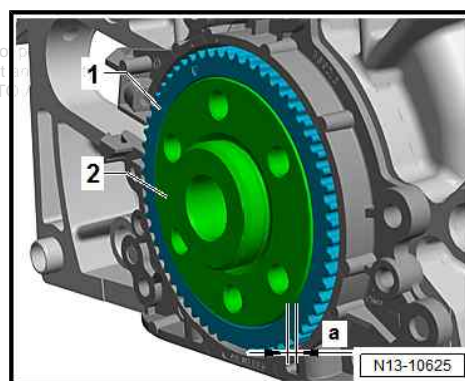
- Measure distance -a- between crankshaft flange -2- and rotor -1-.

Set value: Dimension -a- = 0.5 mm.

If dimension -a- is too small, press rotor down ➔ [page 77](#) .

If the specified value is reached:

- Tighten the new fixing screws of the sealing alternately cross-wise.
- Install engine speed sender - G28-  
➔ ["1.3 Removing and installing the engine speed sender G28", page 269](#) .
- Install oil sump  
➔ ["1.5 Removing and installing oil pan", page 143](#) .
- Installing intermediate plate.
- Install flywheel with new screws.





## Re-pressing sender wheel

- Secure the assembly tool - T10134- and with Allan screws -E- to the crankshaft flange.



### Note

*Make sure the positioning pin of the assembly tool - T10134- engages in the bore of the rotor.*

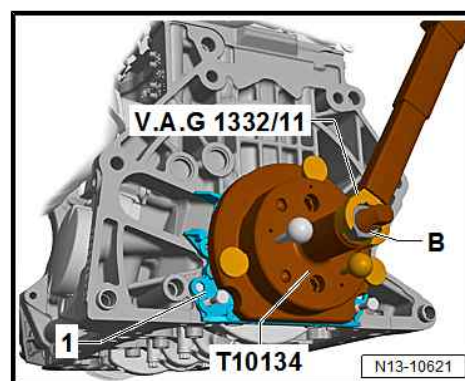
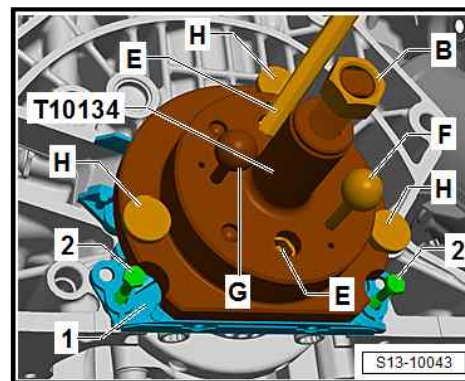
- Tighten the two Allan screws -E- hand-tight.
- Screw the knurled screws -H- into the flange -1-.
- Screw nut -B- onto threaded spindle by hand until it lies against the assembly housing.
- Tighten nut -B- of the assembly tool - T10134- to 40 Nm.
- Check the fitting position of the rotor on the crankshaft again ➔ [page 76](#) .

If the dimension -a- is too small again:

- Tighten the hexagon nut of the assembly device to 45 Nm.
- Check the fitting position of the rotor on the crankshaft again ➔ [page 76](#) .

## Tightening torques

- ◆ Sealing flange on the gearbox side  
➔ [“2.4 Summary of components - gearbox side summary of components and flywheel”, page 69](#)
- ◆ Engine speed sender - G28-  
➔ [“2.4 Summary of components - gearbox side summary of components and flywheel”, page 69](#)
- ◆ Flywheel to crankshaft  
➔ [“2.4 Summary of components - gearbox side summary of components and flywheel”, page 69](#)



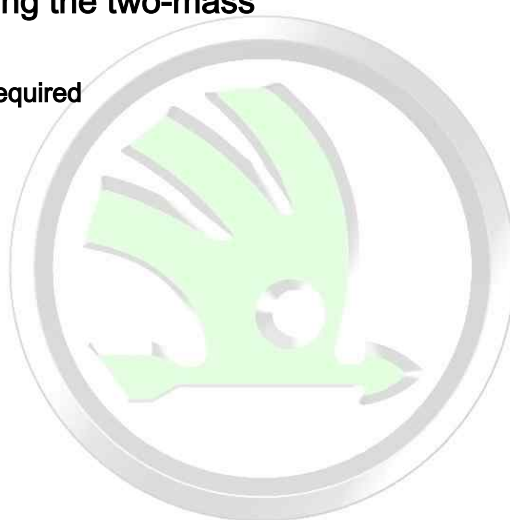
## 2.6 Removing and installing the two-mass flywheel

### Special tools and workshop equipment required

- ◆ Counterholder - MP1-223 (3067)-
- or
- ◆ Engine mount - MP1-202 (VW 540)-
- ◆ Bushing - T30010 (VW 540/1B)-
- ◆ Counterholder - MP1-504 (3067)-

### Removing

- Gearbox removed.



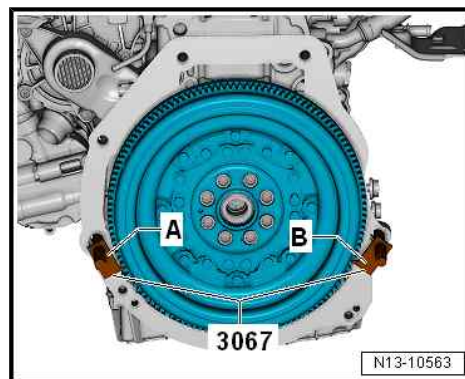
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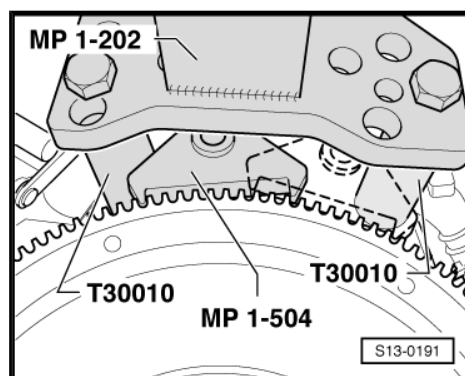
### Engine installed

- Insert the counterholder - MP1-223 (3067)- into the bore hole on the cylinder block.
- Fitting position of the tool:
- A - for tightening
- B - for slackening



### Engine removed

- Position the flywheel lock - MP1-504- on the starter ring gear and turn crankshaft until it rests against the sleeve - T30010- .



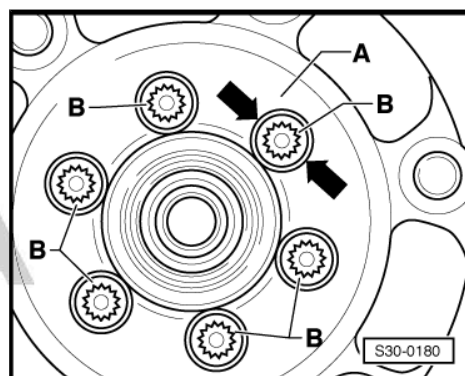
### Continued for all engines

- Rotate the secondary side -A- of the two-mass flywheel in such a way that the screws -B- are positioned in the middle of the holes -arrows-.



#### Caution

*When unscrewing the screws -B-, ensure that no screw head catches on the secondary side -A- of the two-mass flywheel, otherwise it will be damaged.*



- Release screws -B- and remove two-mass flywheel.

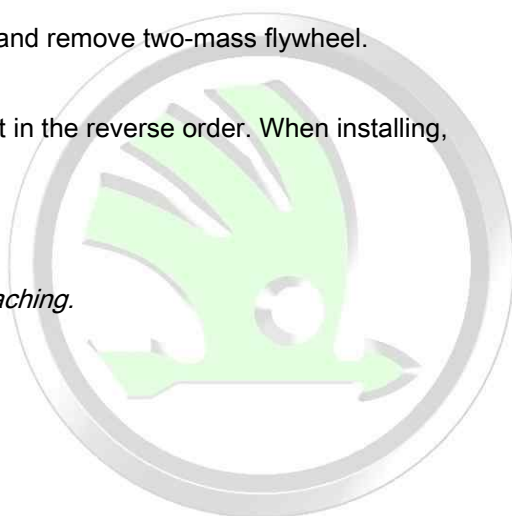
### Installing

Installation is carried out in the reverse order. When installing, observe the following:

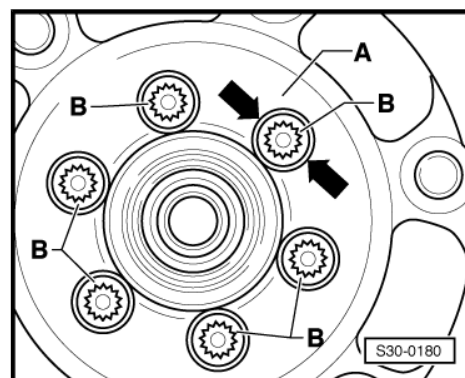


#### Note

*Use new screws for attaching.*



- Rotate the secondary side -A- of the two-mass flywheel in such a way that the screws -B- are positioned in the middle of the holes -arrows-.
- 1. Screw in all the screws -B- by hand.
- 2. First of all tighten all the screws -B- crosswise to 60 Nm.
- 3. Turn all screws -B- a further 90° crosswise.



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### 3 Crankshaft, Piston and Conrod

⇒ [“3.1 Summary of components - Crankshaft Octavia II, Yeti”, page 80](#)

⇒ [“3.2 Summary of components - Crankshaft Superb II”, page 82](#)

⇒ [“3.3 Measuring axial play of crankshaft”, page 83](#)

⇒ [“3.4 Replacing the needle bearing for crankshaft Octavia II, Superb II”, page 83](#)

⇒ [“3.5 Replacing the drive chain sprocket Octavia II, Yeti”, page 84](#)

⇒ [“3.6 Replacing the crankshaft drive pinion Superb II”, page 85](#)

⇒ [“3.7 Assembly overview - piston and conrod”, page 87](#)

⇒ [“3.8 inspect piston projection at TDC”, page 91](#)

⇒ [“3.9 Separating new connecting rod”, page 92](#)

#### 3.1 Summary of components - Crankshaft Octavia II, Yeti



##### Note

*For the performance of assembly work, the engine must be secured at the assembly stands - MP9-101- or at the assembly stands - VAS 6595- ⇒ [“1.4 Securing the engine to the assembly stand”, page 24](#) .*



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### 1 - Bearing shell

- ☐ for cylinder block with lubricating groove
- ☐ do not mix up already used bearing shells (mark)

### 2 - Drive chain sprocket

- ☐ for oil pump
- ☐ Replace  
⇒ [“3.5 Replacing the drive chain sprocket Octavia II, Yeti”, page 84](#)

### 3 - Bearing shell

- ☐ for bearing cap without lubricating groove
- ☐ do not mix up already used bearing shells (mark)

### 4 - Thrust washers

- ☐ for bearing cap 3
- ☐ different versions for bearing cap and cylinder block
- ☐ pay attention to locating element

### 5 - Screw

- ☐ Replace after removal
- ☐ 65 Nm + 90°

### 6 - Bearing caps

- ☐ Bearing cap 1: belt pulley side
- ☐ Bearing cap 3: with recesses for thrust washers

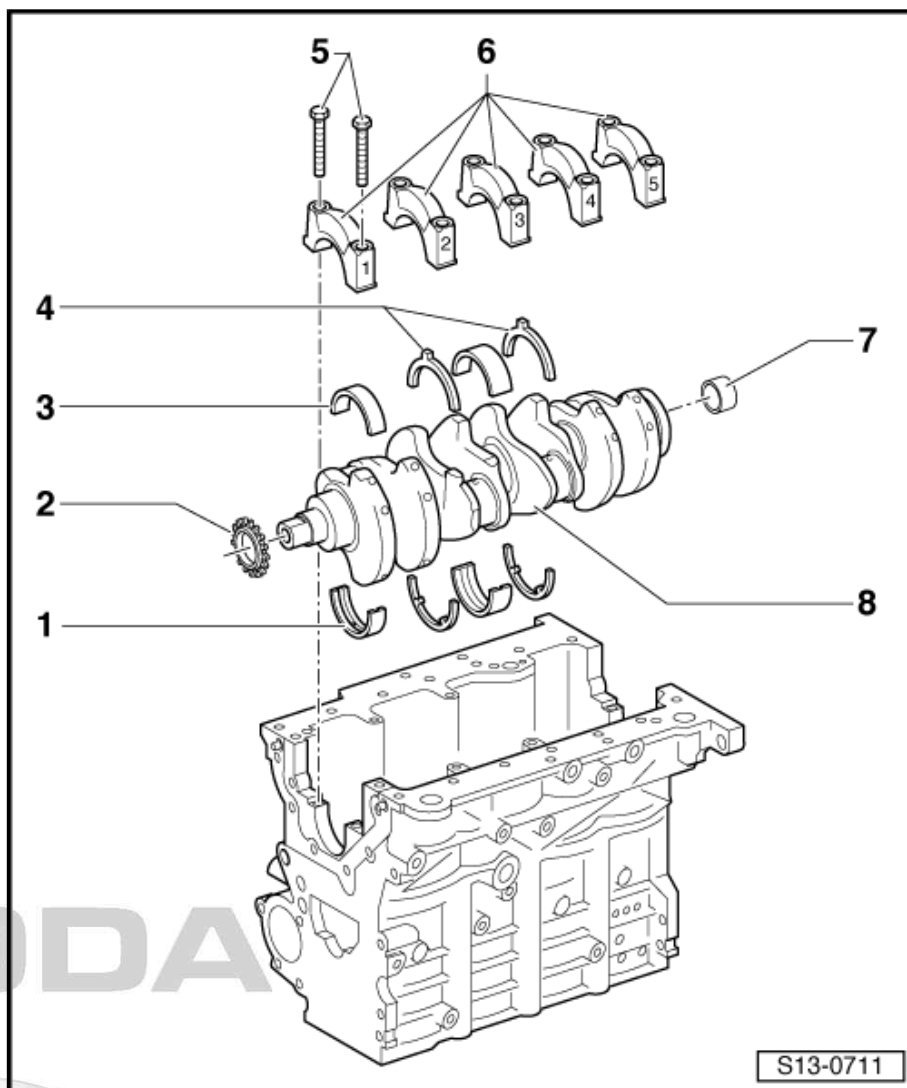
- ☐ retaining lugs of the bearing shells of the cylinder block/bearing cap must be on top of one another

### 7 - Needle bearing

- ☐ only vehicles with automatic gearbox
- ☐ Replace ⇒ [“3.4 Replacing the needle bearing for crankshaft Octavia II, Superb II”, page 83](#)

### 8 - Crankshaft

- ☐ with chain sprocket for oil pump drive
- ☐ Axial play when new: 0.07-0.17 mm  
Wear limit: 0,37 mm
- ☐ Crankshaft bearing pin:  $\varnothing$  54.00 mm
- ☐ Conrod bearing pin:  $\varnothing$  50.90 mm
- ☐ Measure axial play ⇒ [“3.3 Measuring axial play of crankshaft”, page 83](#)



S13-0711





## 3.2 Summary of components - Crankshaft Superb II



### Note

For the performance of assembly work, the engine must be secured at the assembly stands - MP9-101- or at the assembly stands - VAS 6595-

⇒ ["1.4 Securing the engine to the assembly stand", page 24](#) .

#### 1 - Bearing shell

- ☐ for cylinder block with lubricating groove
- ☐ do not mix up already used bearing shells (mark)

#### 2 - Drive pinion

- ☐ Replace  
⇒ ["3.6 Replacing the crankshaft drive pinion Superb II", page 85](#)

#### 3 - Bearing shell

- ☐ for bearing cap without lubricating groove
- ☐ do not mix up used bearing shells (mark)

#### 4 - Thrust washers

- ☐ for bearing 3
- ☐ different version for cylinder block and bearing cap
- ☐ pay attention to locating element

#### 5 - Screw

- ☐ Replace after removal
- ☐ 65 Nm + 90°

#### 6 - Bearing caps

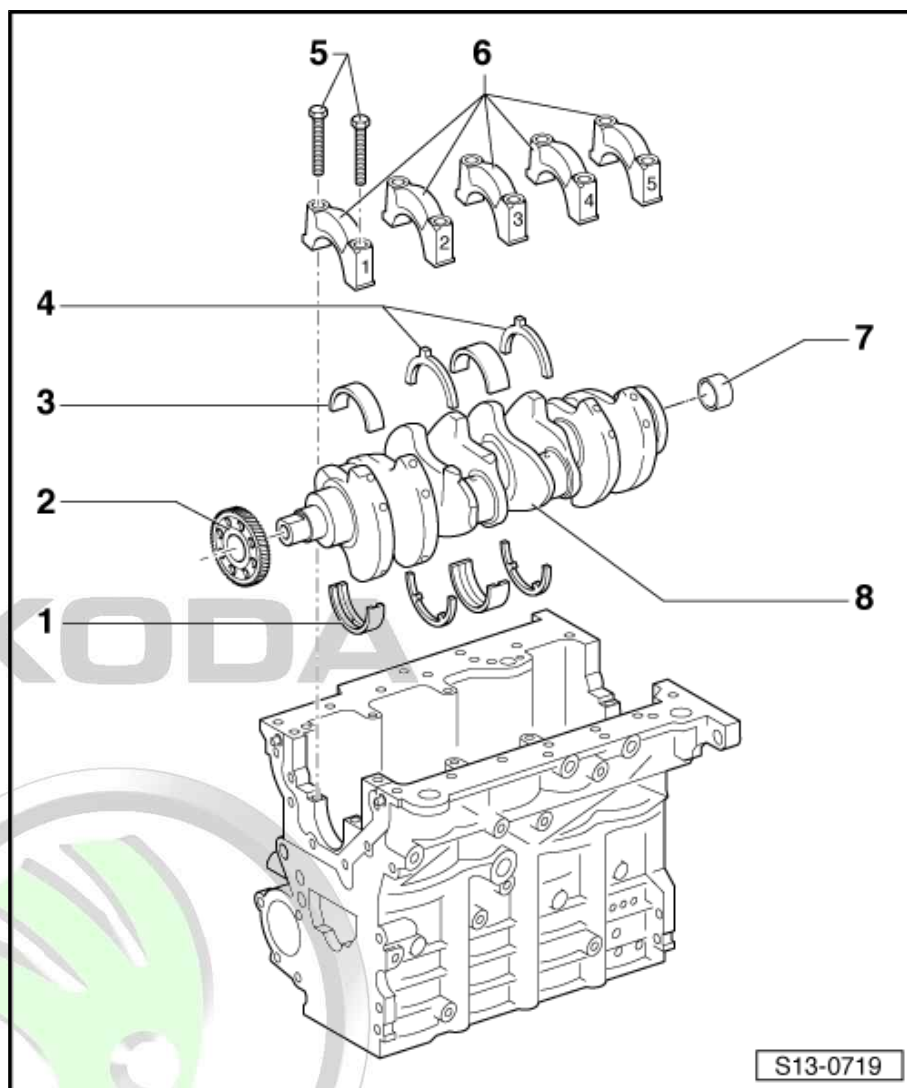
- ☐ Bearing cap 1: belt pulley side
- ☐ bearing cap 3 with recesses for thrust washers
- ☐ Retaining lugs of the bearing shells of the cylinder block/bearing cap must be opposite each other

#### 7 - Needle bearing

- ☐ only vehicles with automatic gearbox
- ☐ Replace ⇒ ["3.4 Replacing the needle bearing for crankshaft Octavia II, Superb II", page 83](#)

#### 8 - Crankshaft

- ☐ Measure axial play ⇒ ["3.3 Measuring axial play of crankshaft", page 83](#)
- ☐ Axial play when new: 0.07...0.17 mm, wear limit: 0.37 mm
- ☐ Crankshaft bearing pin:  $\varnothing$  54.00 mm
- ☐ Conrod bearing pin:  $\varnothing$  50.90 mm



### 3.3 Measuring axial play of crankshaft

#### Special tools and workshop equipment required

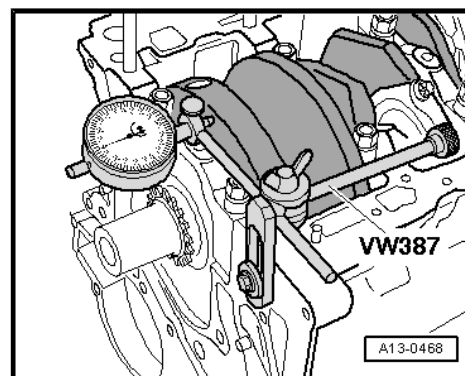
- ◆ Universal dial gauge bracket - MP3-447 (VW 387)-
- ◆ Dial gauge , e.g. -VAS 6079-

#### Work procedure

- Secure the dial gauge with universal dial gauge bracket - MP3-447 (VW 387)- to the cylinder block, as shown in the illustration, and against the crankshaft cheek.
- Press the crankshaft by hand against the dial gauge.
- Position dial gauge to "0".
- Press the crankshaft off the dial gauge and read the value.

Axial play of crankshaft:

- Set value when new: 0.07-0.17 mm
- Wear limit: 0,37 mm



### 3.4 Replacing the needle bearing for crankshaft Octavia II, Superb II

Only on vehicles fitted with automatic gearbox.

#### Special tools and workshop equipment required

- ◆ Centering mandrel - T30029 (3176)-
- ◆ Interior extractor - Kukko 21/1-
- ◆ Countersupport - Kukko 22/1-



#### Note

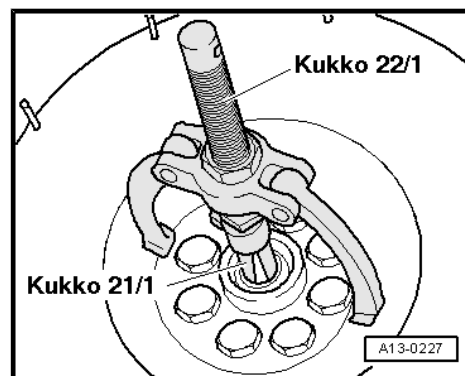
*For installing an engine in a vehicle with automatic gearbox, check whether the needle bearing is built on the gearbox side in the crankshaft. Install the needle bearing as required.*

#### Removing

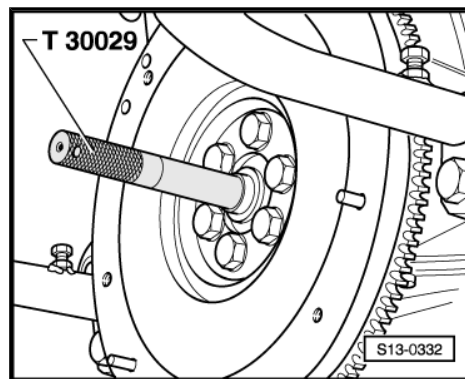
- Pull out needle bearing with interior extractor - Kukko 21/1- and countersupport - Kukko 22/1- .

#### Installing

- Fitting position: The marked side of the needle bearing should be legible when in its installed condition.

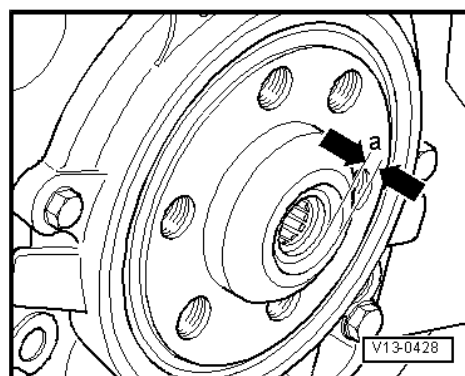


- Drive in the needle bearing using the centring pin - T30029- .



Depth of installation of the needle bearing

- Dimension -a- = 1.5 mm ... 1.8 mm



### 3.5 Replacing the drive chain sprocket Octavia II, Yeti

#### Special tools and workshop equipment required

- ◆ Drive bushing - MP1-316 (30-100)-
- ◆ Two-arm extractor, standard commercially available
- ◆ Protective gloves

#### Removing

- Remove the sealing flange on the belt pulley side  
⇒ [“2.3 Removing and installing the sealing flange on the belt pulley side”, page 67](#) .
- Remove chain tensioner, chain and chain sprocket for oil pump.
- Remove drive chain sprocket for crankshaft with two-arm extractor -2-. At the same time protect the crankshaft journal with a suitable washer -1-.

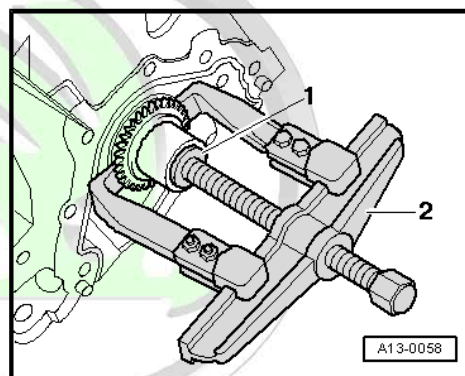
#### Installing

Assembly is carried out in the reverse order. When installing, observe the following:



#### WARNING

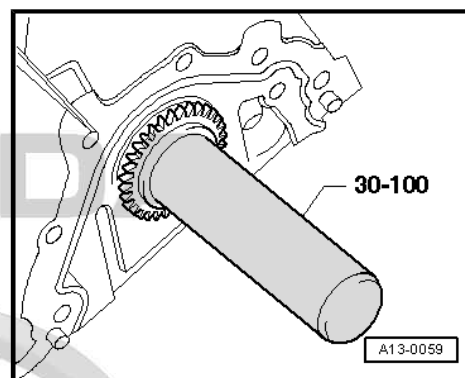
*Wear protective gloves!*



- Heat up the drive chain sprocket in an oven for about 15 minutes to 220 °C.

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- Place the drive chain sprocket on the shaft end using pliers and with bushing - 30-100- slide on until the stop on the crankshaft is reached.
- Fitting position: the broader collar of the drive chain sprocket (45° chamfer in the hole) points to the engine.



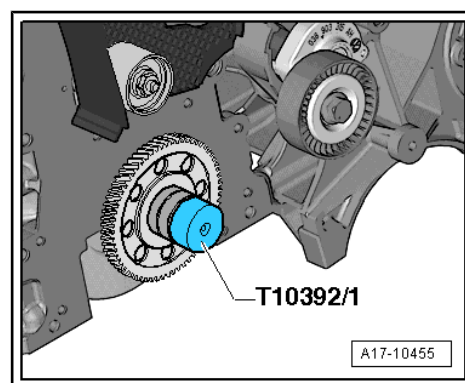
### 3.6 Replacing the crankshaft drive pinion Superb II

#### Special tools and workshop equipment required

- ◆ Commercially available heater unit
- ◆ Insertion tool - MP1-214 (10-203)-
- ◆ Extractor - T10392-
- ◆ Thrust piece - T10392/1-
- ◆ Multimeter in combination with temperature sender - V.A.G 1526 B-

#### Removing

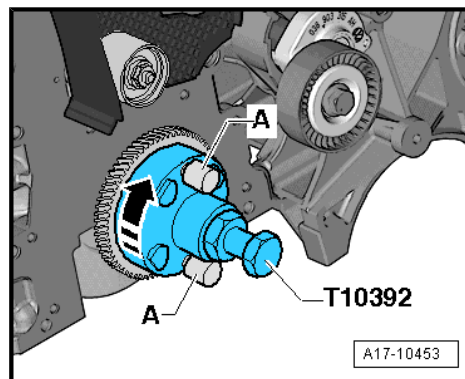
- Remove the sealing flange on the belt pulley side  
⇒ [“2.3 Removing and installing the sealing flange on the belt pulley side”, page 67](#) .
- Removing the oil pan  
⇒ [“1.5 Removing and installing oil pan”, page 143](#) .
- Remove balancing shaft module  
⇒ [“1.8 Removing and installing balancing shaft module Superb II”, page 148](#) .
- Position the thrust piece - T10392/1- on the crankshaft.







- Insert the extractor - T10392- into the holes of the drive pinion, turn the extractor in clockwise direction -arrow- and screw in rig pins -A-.



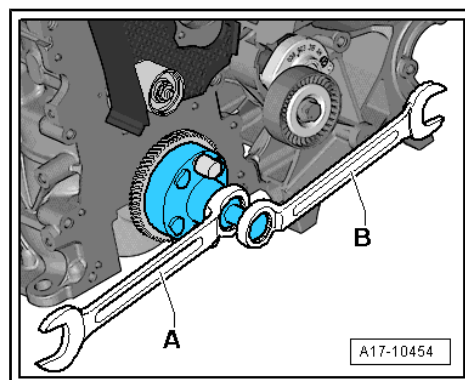
- Hold the crankshaft using the ring spanner -A- and remove the gear pinion from the crankshaft journal by tightening the screw using the ring spanner -B- or the ratchet.

### Installing



#### Note

- ♦ Check the temperature when heating up the new drive wheel with the temperature measuring instrument - VAS 6519- or the hand-held multimeter - V.A.G 1526- in combination with the sender - V.A.G 1526D/1- , to do so press the tracing point of the temperature sender at the drive wheel.
- ♦ When heating the wheel to a temperature of 200 °C, there are approx. 4 seconds available in order to insert the drive wheel on the crankshaft journal.
- ♦ A higher heat temperature extends the manipulation time, at 220 °C approx. 6 seconds are available.
- ♦ Pay attention to cleanliness at crankshaft journal.



#### WARNING

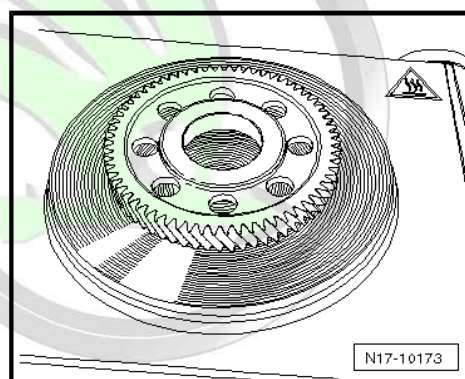
**The maximum temperature of 240°C must not be exceeded otherwise the drive wheel changes colour or deforms.**

Place the new drive pinion with the entire surface onto the commercially available heater unit and heat up to at least 200 °C, however at a maximum of 240 °C, the legend points to the top.



#### WARNING

**Risk of burning. You must wear suitable protective gloves for the further work procedure.**

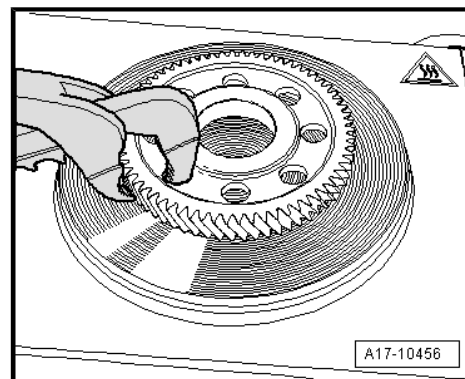


#### Note

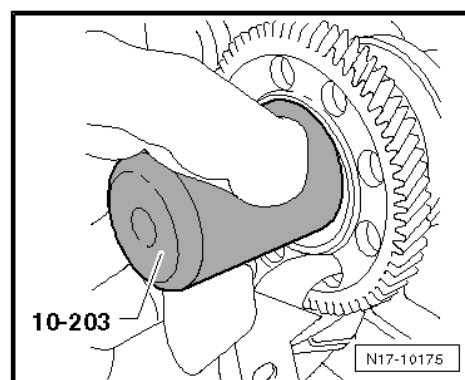
**Make sure that the gear tooth system is not damaged.**

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- Remove the drive pinion with pliers after reaching the temperature as shown in the illustration.



- Push the gear pinion forcefully by hand onto the crankshaft journal without deadlock up to the stop using the insertion tool - MP1-214 (10-203) - .
- Let the drive pinion cool down for a few minutes and then install the balancing shaft module  
⇒ ["1.10 Re-installing the already used balancing shaft module Superb II", page 151](#) .



### 3.7 Assembly overview - piston and conrod

Special tools and workshop equipment required

- ◆ Drift - VW 222A-



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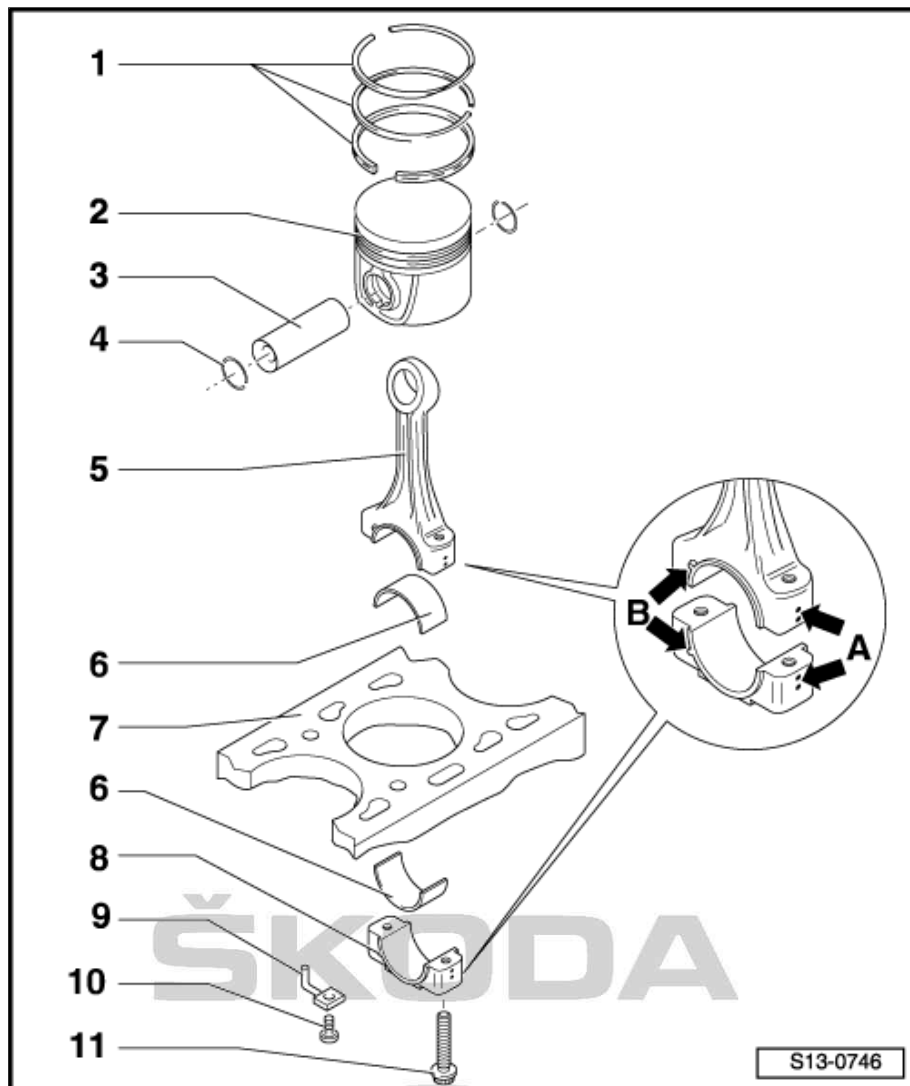


### 1 - Piston rings

- ☐ Offset gaps by 120°.
- ☐ use piston ring pliers for removing and installing
- ☐ marking "TOP" faces piston crown
- ☐ Check ring gap  
⇒ [page 89](#)
- ☐ Check end clearance  
⇒ [page 90](#)

### 2 - Piston

- ☐ with combustion chamber
- ☐ Mark the installation position and the assignment to cylinder
- ☐ Installation position and assignment of piston/cylinder ⇒ [page 90](#)
- ☐ arrow on the piston crown faces towards the belt pulley side
- ☐ replace the piston if there is any sign of crack formation
- ☐ Inspecting piston  
⇒ [page 90](#)
- ☐ Piston dimension:  $\varnothing$  80.96 mm
- ☐ Install using piston ring tensioning strap
- ☐ inspect piston projection at TDC  
⇒ ["3.8 inspect piston projection at TDC", page 91](#)



### 3 - Piston pin

- ☐ If difficult to remove, heat piston to 60 °C.
- ☐ use drift - VW 222A- for removing and installing

### 4 - Circlip

- ☐ Replace after removal

### 5 - Connecting rod

- ☐ always replace as a set only
- ☐ Mark assignment to cylinder -A-.
- ☐ Fitting position: markings -B- point towards the belt pulley side
- ☐ with a split bearing cap
- ☐ separate new conrod ⇒ ["3.9 Separating new connecting rod", page 92](#)
- ☐ Axial clearance: Wear limit 0.37 mm

### 6 - Bearing shell

- ☐ do not mix up already used bearing shells (mark)
- ☐ Observe version: top bearing shell (towards the piston) must be made from a long lasting material, recognition feature for new bearing shells: black marking on the contact surface near the separation point
- ☐ Fitting position ⇒ [page 91](#)
- ☐ check correct fitting
- ☐ Axial play wear limit: 0.37 mm

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## 7 - Cylinder block

- ☐ Inspect cylinder ➔ [page 91](#)
- ☐ Cylinder dimension:  $\varnothing$  81.01 mm

## 8 - Connecting rod bearing cap

- ☐ Check fitting position
- ☐ cracked cover fits only in one position at the relevant conrod
- ☐ separate new conrod ➔ [“3.9 Separating new connecting rod”, page 92](#)

## 9 - Oil spray jet

- ☐ for piston cooling
- ☐ Removing and installing ➔ [page 91](#)

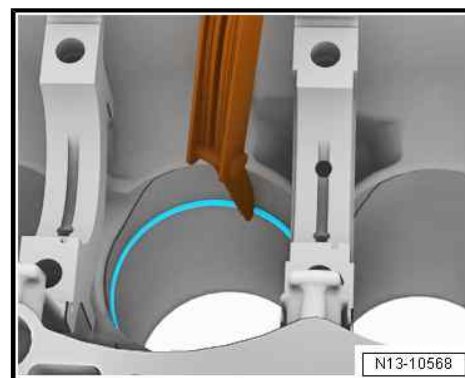
## 10 - Pressure valve

- ☐ replace without sealant
- ☐ Removing and installing ➔ [page 91](#)
- ☐ 27 Nm

## 11 - Screw

- ☐ Replace after removal
- ☐ Oil threads and contact surface.
- ☐ 30 Nm + 90°

## Checking piston ring gap



## Special tools and workshop equipment required

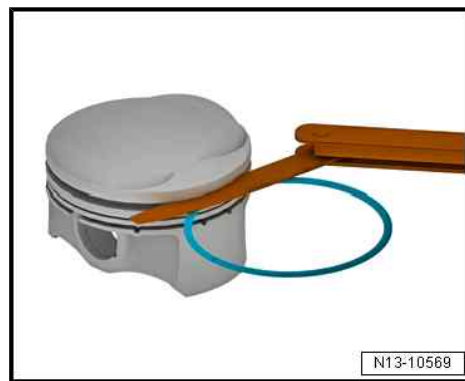
- ◆ Feeler gauge
- Insert ring at right angles from above down into the lower cylinder opening, about 15 mm away from edge of cylinder. To insert use piston without rings.

Piston ring (dimensions in mm)	New	Wear limit
1st compression ring	0.20 - 0.40	1.00
2nd compression ring	0.20 - 0.40	1.00
Oil scraper ring	0.25 - 0.50	1.00





## Checking ring-to-groove clearance

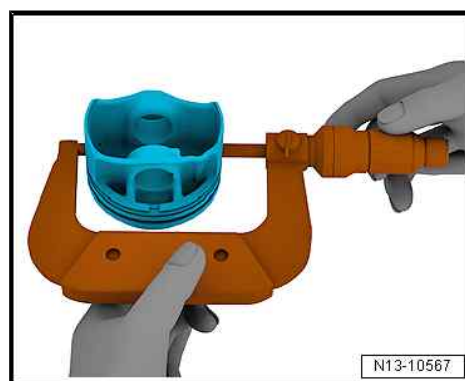


### Special tools and workshop equipment required

- ◆ Feeler gauge
- Clean before inspecting the annular grooves of the piston.

Piston ring (dimensions in mm)	New	Wear limit
1st compression ring	0.06 - 0.09	0.25
2nd compression ring	0.05 - 0.08	0.25
Oil scraper ring	0.03 - 0.06	0.15

### Inspecting piston

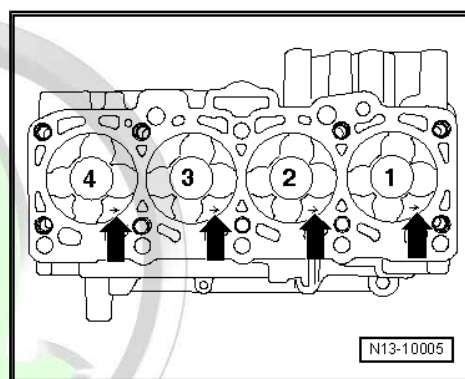


### Special tools and workshop equipment required

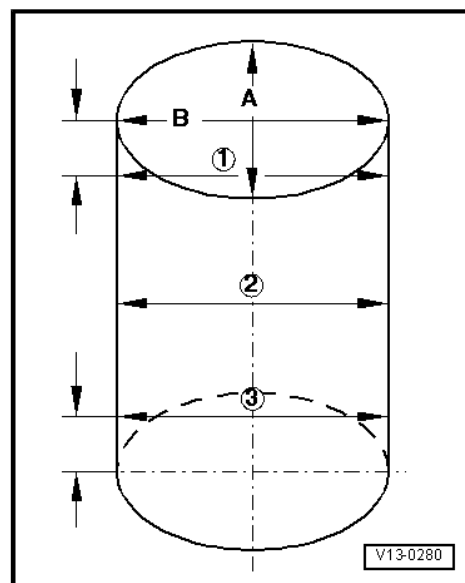
- ◆ External micrometer
- Measure about 10 mm from the lower edge, offset at right angles to the piston pin shaft.
- Max. deviation from specified dimension: 0,04 mm.

### Installation position and assignment of piston/cylinder

- The arrow on the piston crown -arrows- faces towards the belt pulley side.



## Checking cylinder bores

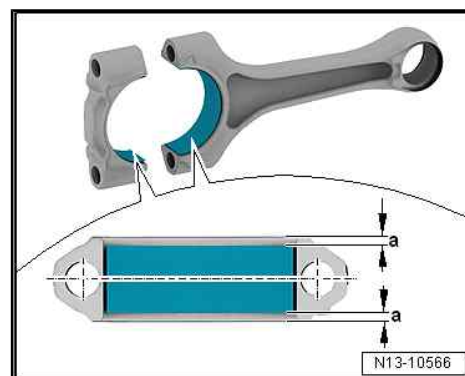


### Special tools and workshop equipment required

- ◆ Cylinder gauge
- Measure cylinder at 3 points crosswise in transverse direction -A- and lengthwise -B-.
- Max. deviation from specified dimension: 0,10 mm.

### Fitting position of the bearing shells in the conrods

- Insert bearing shell symmetrically in the connecting rod or in the big-end bearing cap.
- Dimension -a- = 2.5 mm.



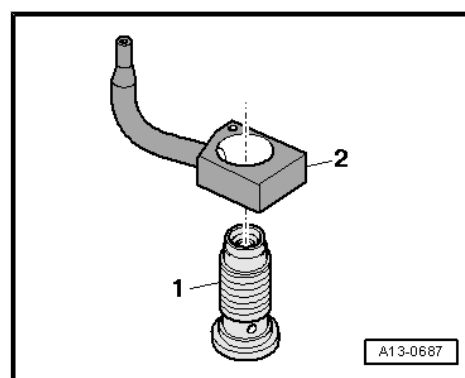
### Oil spray nozzle and pressure relief valve

- 1 - Screw with pressure relief valve
  - 2 - Oil spray nozzle (for cooling piston)
- Fitting position: Align the guide edge of the oil injection nozzle to the area of the cylinder block being worked on.



#### Note

- ◆ The oil injection nozzles must not be bent.
- ◆ Replace the oil injection nozzles if they are bent.



## 3.8 inspect piston projection at TDC

### Special tools and workshop equipment required

- ◆ Measuring tool for liner pretension - MP1-107-

## Test sequence

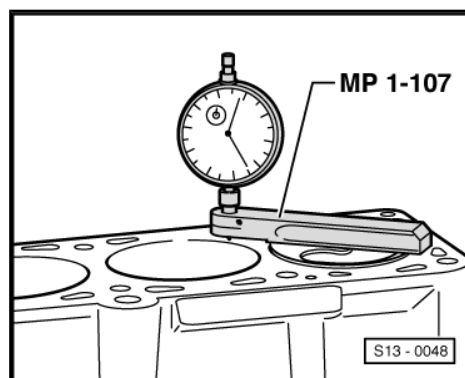
- Attach the measuring tool for liner pretension - MP1-107- to the cylinder block as shown in the illustration.
- Measure the projection for each cylinder at 2 points.

When fitting new pistons or a partial engine, check the piston projection in TDC on all pistons.

If different values are measured during the projection measurement of the piston, the greatest dimension applies for the seal assignment.

Depending on the piston projection fit the relevant cylinder head seal in accordance with the table below.

Piston projection over cylinder block - top side mm	Identification Number of bores
0.91 - 1.00	1
1.01 - 1.10	2
1.11 - 1.20	3



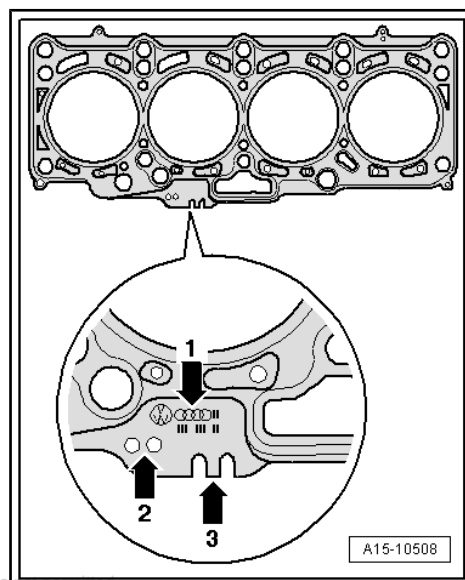
## Identification of the cylinder head gasket

- ♦ Part number = arrow -1-
- ♦ Bores arrow -2-
- ♦ Control code arrow -3- (ignore)



### Note

If different values are measured during the projection measurement of the piston, the greatest dimension applies for the seal assignment.



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## 3.9 Separating new connecting rod

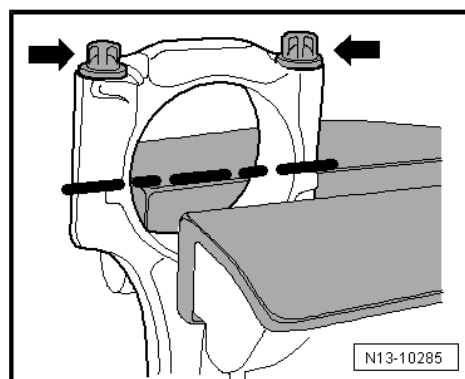
On new conrods it is possible that the target breaking point is not fully broken through. If the connecting rod bearing cap cannot be removed by hand, then proceed as follows:

- Mark the assignment of the connecting rod to the cylinder.
- Slightly clamp the conrod, as shown in the illustration, in a vice with aluminium protective jaws.

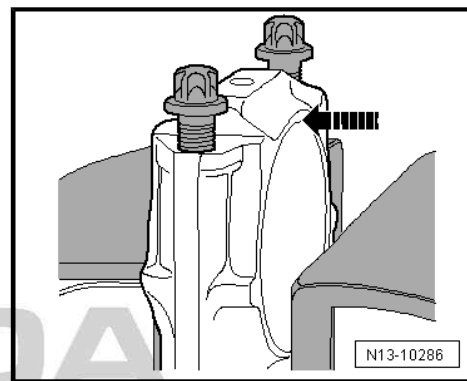


### Note

- ♦ Only tension the conrod slightly in order to avoid damage.
- ♦ The conrod is clamped beyond the breaking point, which is shown in the figure with a broken line.
- Unscrew both screws -arrows- by approx. 5 turns.



- Carefully knock on the conrod bearing cap with a rubber hammer in -direction of arrow- in order to loosen the cap.



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## 15 – Cylinder head, valve gear

### 1 Cylinder head

⇒ [“1.1 Assembly overview - cylinder head cover”, page 94](#)

⇒ [“1.2 Removing and installing cylinder head cover”, page 96](#)

⇒ [“1.3 Summary of components - cylinder head”, page 99](#)

⇒ [“1.4 Removing and installing cylinder head”, page 102](#)

⇒ [“1.5 Removing and installing Hall sender G40”, page 112](#)

⇒ [“1.6 Removing and installing the vacuum pump”, page 113](#)

⇒ [“1.7 Checking compression”, page 113](#)



#### Note

- ◆ *Cylinder heads with cracks between the valve seats may continue to be used without any reduction in the life time provided the cracks are slight and max. 0.5 mm wide.*
- ◆ *It is not permissible to rework the cylinder heads of diesel engines.*
- ◆ *Replace gaskets and O-rings.*
- ◆ *Replace cylinder head bolts and screws which have been tightened to a torquing angle.*
- ◆ *When installing an exchange cylinder head with the camshafts installed, it is necessary to oil the contact surfaces between the roller arms and the cams after installing the head.*
- ◆ *Do not remove the plastic bases supplied as a protection for the open valves until just before fitting on the cylinder head.*
- ◆ *When replacing the cylinder head, replace all the coolant*  
⇒ [“1.3 Draining and filling coolant”, page 163](#) .
- ◆ *Change contaminated engine oil:*
  - ⇒ Maintenance ; Booklet Octavia II .
  - ⇒ Maintenance ; Booklet Superb II .
  - ⇒ Maintenance ; Booklet Yeti .

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### 1.1 Assembly overview - cylinder head cover

**1 - Screw**

- ☐ 5 Nm

**2 - Fuel high pressure reservoir**

- ☐ with injection lines
- ☐ do not change the flexion of the injection lines  
⇒ [“2.1 Assembly overview - fuel system”, page 271](#)

**3 - Screw**

- ☐ 22 Nm

**4 - Injection unit**

- ☐ Removing and installing  
⇒ [“2.3 Removing and installing the injection units”, page 276](#)

**5 - Screw**

- ☐ 5 Nm

**6 - Cover for injection unit**

**7 - Grommet**

- ☐ for attaching the high fuel pressure accumulator
- ☐ Replace if damaged.

**8 - Nut**

- ☐ 10 Nm

**9 - Clamping claw**

- ☐ pay attention to correct installation position  
⇒ [page 275](#)

**10 - Mounting bracket**

- ☐ for wiring loom

**11 - Cylinder head cover**

- ☐ Removing and installing ⇒ [“1.2 Removing and installing cylinder head cover”, page 96](#)

**12 - Seal**

- ☐ replace if damaged or leaking

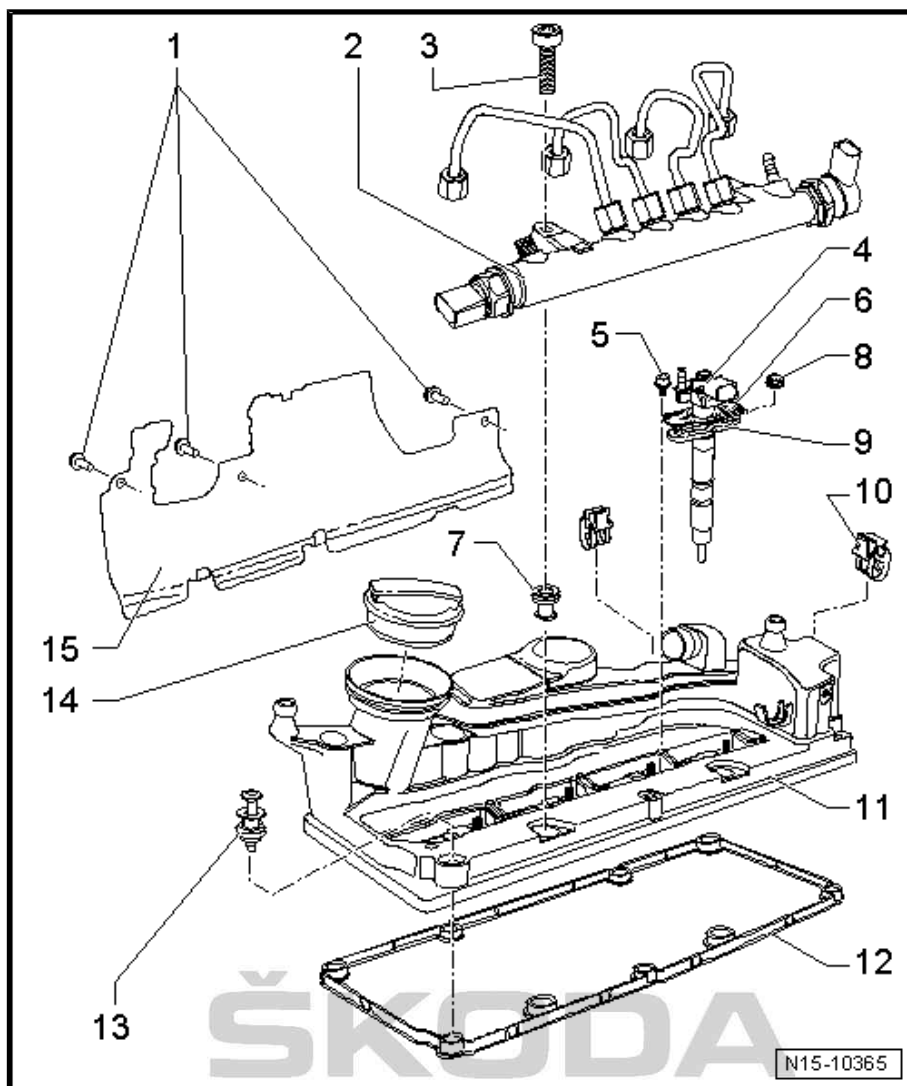
**13 - Screw**

- ☐ Observe tightening torque and tightening sequence ⇒ [page 96](#)
- ☐ Insert screw with bush and elastomer damping element in the cylinder head cover in such a way that it does not fall out
- ☐ 10 Nm

**14 - Screw cap**

- ☐ replace damaged gasket

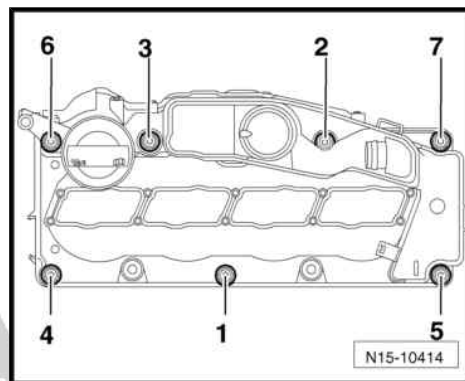
**15 - Heat shield**





### Cylinder head cover - tightening torque and tightening order

- Tighten the screws for the cylinder head cover in the sequence -1...7- to 10 Nm.



## 1.2 Removing and installing cylinder head cover

### Removing

Observe all safety measures and notes for assembly work on the fuel system and on the injection system as well as the rules for cleanliness

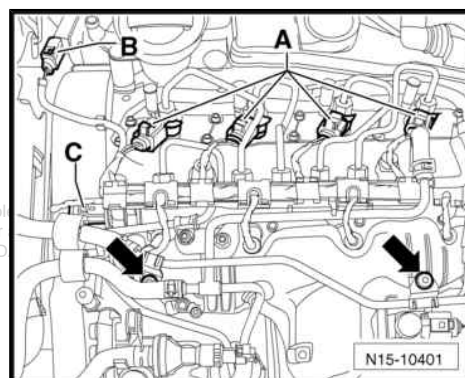
⇒ ["2 Self diagnosis, safety measures, cleanliness regulations and directions", page 2](#) .

- Remove engine cover  
⇒ ["1.1 Removing and installing engine trim panel", page 7](#) .
- Take out the noise insulation at the injection units.
- Disconnect the plugs at the injection units -A-, the exhaust gas pressure sensor 1 - G450- -B- and the fuel pressure sender - G247- -C-.
- Unscrew the fixing screws -arrows- of the coolant line from the intake manifold and lay the line in front of the intake manifold.
- Slacken the wiring loom from the wiring guide of the glow plugs.

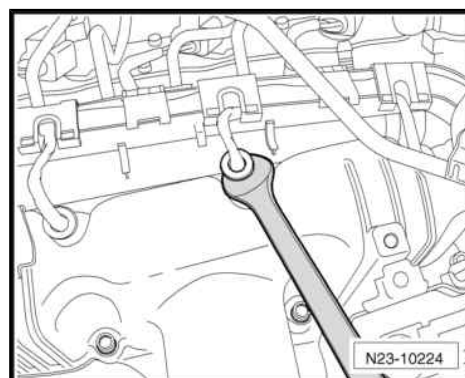


### Caution

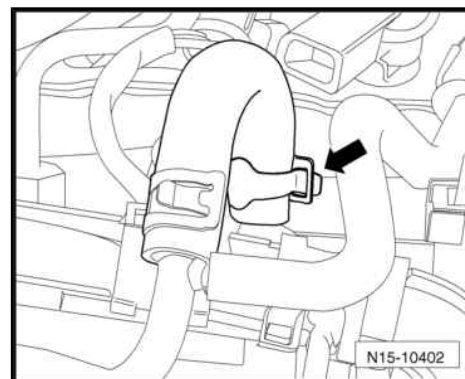
- ◆ *Carefully disconnect the plug from the glow plugs.*
- ◆ *If the plug is damaged when disconnecting it, the complete wiring loom including the plugs must be replaced (plugs cannot be replaced separately).*



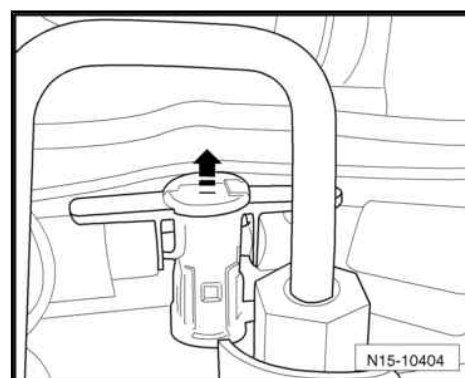
- Carefully disconnect the plug from the glow plugs. Use the assembly spanner SW 11 for help.
- Release fixing screw for fuel return line at intake manifold.



- Slacken spring strap clamp -arrow- and detach the line from the high fuel pressure accumulator.



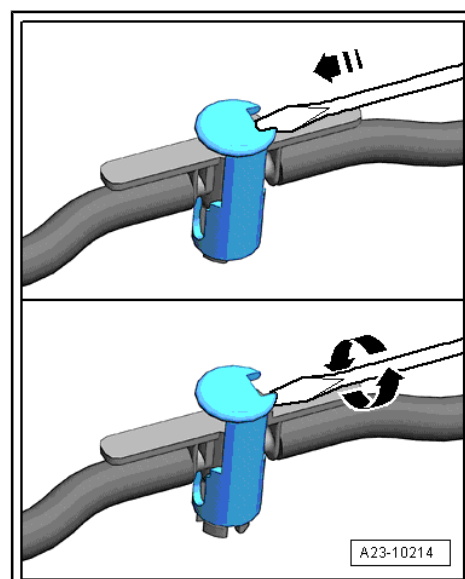
- Remove the connections of the fuel return-flow line from the injection units. To unlock, pull upwards -arrow-.



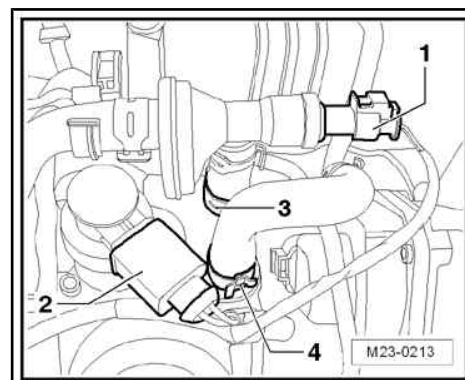
#### Note

- ◆ If the unlocking bolt of the connection for the fuel return-flow line cannot be pulled up by hand, slacken the bolt by turning it with a narrow screwdriver -arrows-.
- ◆ Pay attention to cleanliness, no impurities must get into the open return lines and into the connections of the injection units.

- Slacken the spring strap clamp and detach the fuel return-flow line to the fuel filter.



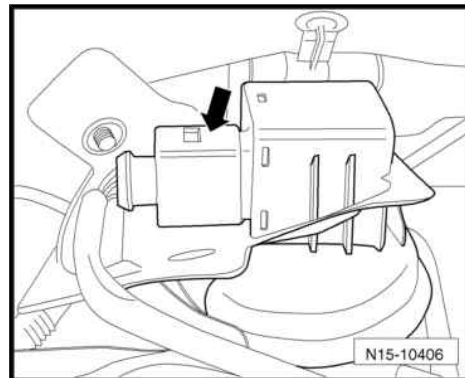
- Slacken spring strap clamp -4- and detach the fuel return-flow line from the high pressure pump.
- Seal the lines so that no dirt can get into the fuel system.
- Remove fuel return-flow lines and lay them in front of the intake manifold.



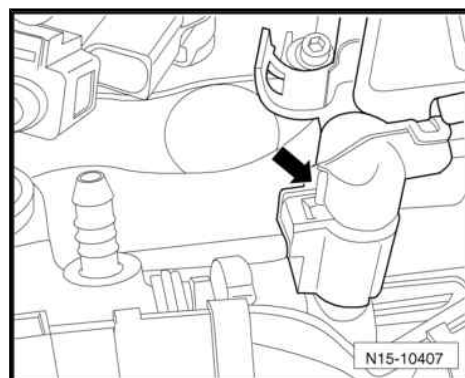




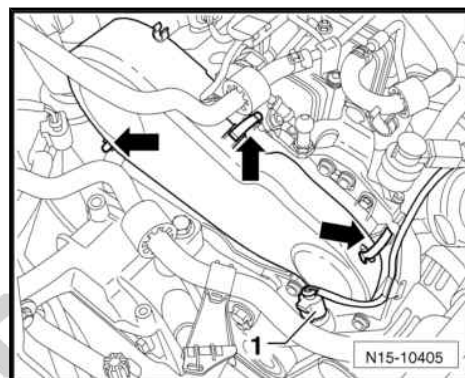
- Disconnect the plug from the position sender for charge pressure regulator - G581- -arrow- at the vacuum setting element of the exhaust turbocharger and unhook the cable.



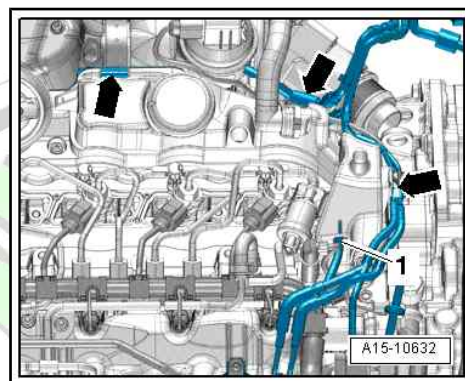
- Disconnect the plug from the fuel pressure regulating valve - N276- -arrow-.
- Remove the wiring from the high fuel pressure accumulator and lay it to the side.



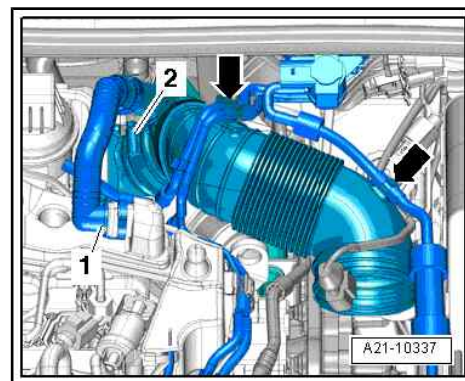
- Disconnect plug -1- from coolant temperature sender at radiator outlet - G83- , open clamps -arrow- and remove top part of toothed belt guard.



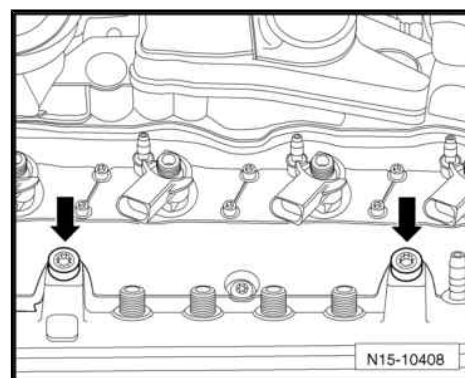
- Detach the vacuum hose -1- from the cylinder head cover.
- Expose the electrical lines and detach the remaining vacuum hoses -arrows-.



- Remove the hose -1- for the crankcase ventilation from the cylinder head cover, to do so press the release buttons.
- Remove the high pressure line between the high pressure pump and the high fuel pressure accumulator.
- Remove high pressure lines between high fuel pressure accumulator and injection units.



- Unscrew screws -arrows- and remove high fuel pressure accumulator.
- Remove the injection units  
⇒ [“2.3 Removing and installing the injection units”, page 276](#).



- Release the screws for the cylinder head cover in the sequence -7...1- and remove the cylinder head cover.

### Installing

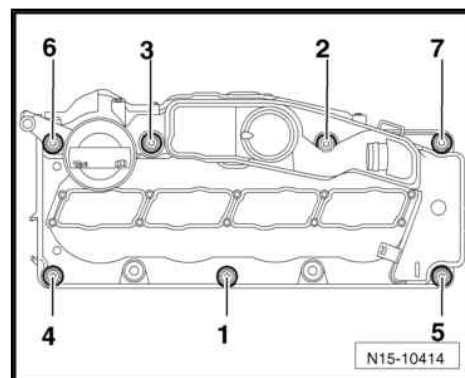
Installation is carried out in the reverse order. When installing, observe the following:



#### Note

*Replace gasket for cylinder head cover if damaged or leaking.*

- Tighten screws for cylinder head cover ⇒ [page 96](#).
- Install the injection units  
⇒ [“2.3 Removing and installing the injection units”, page 276](#).



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### Tightening torques

- ◆ Screws for cylinder head cover  
⇒ [“1.1 Assembly overview - cylinder head cover”, page 94](#).
- ◆ Injection units  
⇒ [“2.1 Assembly overview - fuel system”, page 271](#).

## 1.3 Summary of components - cylinder head



#### Note

- ◆ *Do not remove the plastic bases supplied as a protection for the open valves until just before fitting on the cylinder head.*
- ◆ *When replacing the cylinder head, replace all the coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#).*



## 1 - Cylinder head

- ☐ Removing and installing  
⇒ ["1.4 Removing and installing cylinder head", page 102](#)
- ☐ check for distortion  
⇒ [page 101](#)
- ☐ After replacing, fill with fresh coolant  
⇒ ["1.3 Draining and filling coolant", page 163](#)

## 2 - Washer

- ☐ for cylinder head screw

## 3 - Cylinder head bolt

- ☐ Replace after removal
- ☐ Follow the specific sequence for loosening and tightening  
⇒ ["1.4 Removing and installing cylinder head", page 102](#)
- ☐ before fitting insert washers in the cylinder head

## 4 - Screw

- ☐ 25 Nm

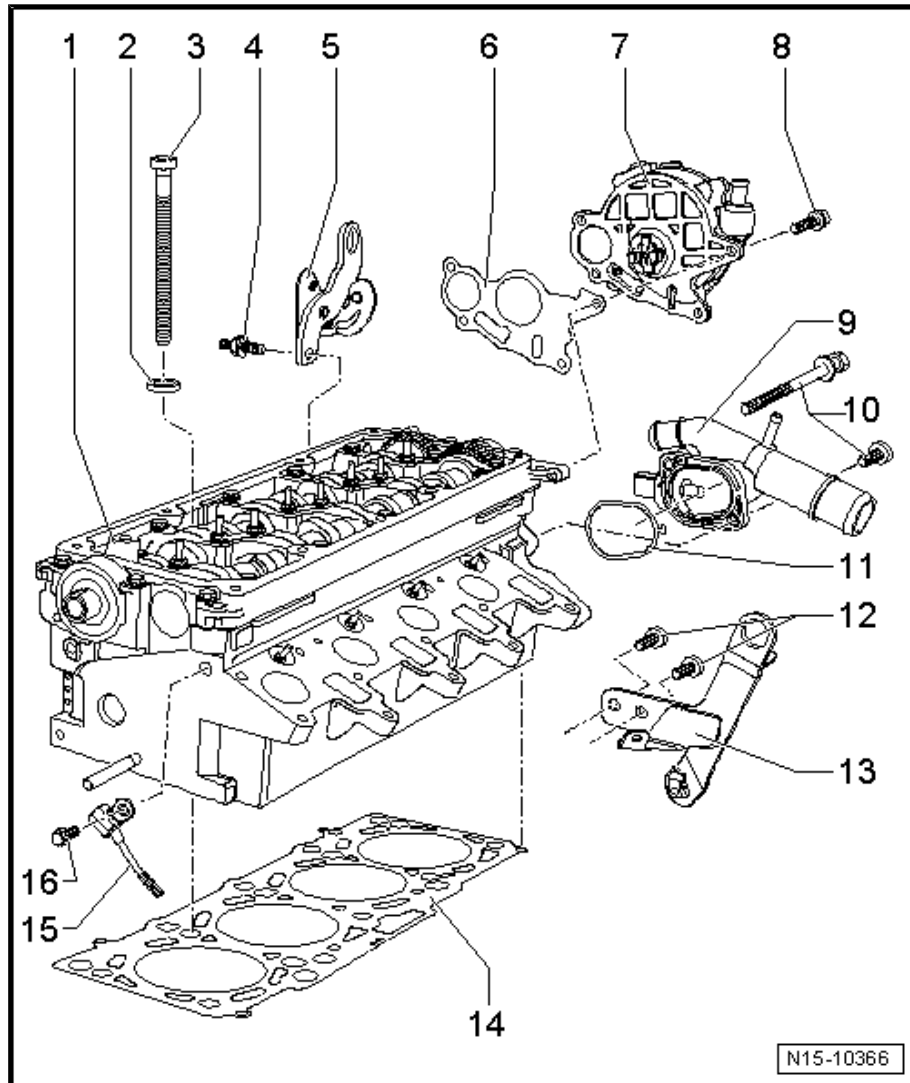
## 5 - Shackle

- ☐ at rear left of cylinder head

## 6 - Seal

- ☐ Replace after removal

## 7 - Vacuum pump



### WARNING

*The vacuum pump must on no account be disassembled, otherwise the proper operation of the pump vacuum part is no longer assured. This will result in a failure of the brake booster.*

- ☐ Removing and installing ⇒ ["1.6 Removing and installing the vacuum pump", page 113](#)

## 8 - Screw

- ☐ 10 Nm

## 9 - Connection fitting

- ☐ for coolant with coolant temperature sender - G62-
- ☐ Replace coolant temperature sender - G62-  
⇒ ["3.2 Replace coolant temperature sender G62", page 175](#)

## 10 - Screw

- ☐ 10 Nm

## 11 - Seal

- ☐ Replace after removal

## 12 - Screw

- ☐ Replace after removal
- ☐ 20 Nm + 45°

## 13 - Shackle

- ☐ at front left of cylinder head
- ☐ the front right lifting eye is attached at the bracket for auxiliary units in the same way

## 14 - Cylinder head gasket

- ☐ Replace after removal
- ☐ Pay attention to the marking ⇒ [page 101](#)
- ☐ After replacing, fill entire system with fresh coolant.

## 15 - Hall sender - G40-

- ☐ for camshaft position
- ☐ Removing and installing ⇒ [“1.5 Removing and installing Hall sender G40”, page 112](#)

## 16 - Screw

- ☐ insert using locking agent -D 000 600 A2-
- ☐ 10 Nm

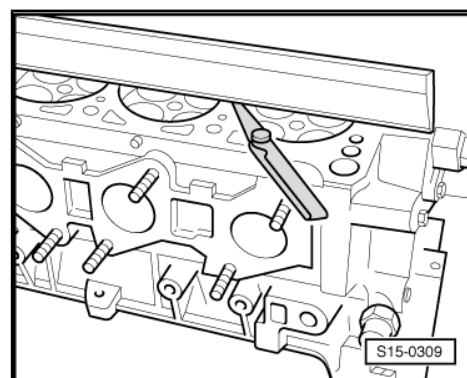
## Checking cylinder head for distortion

- Inspect cylinder head at several points for distortion using a 500 mm knife-edge straightedge, e.g. -VAS 6075- and feeler gauge.
- Maximum permissible deviation: 0.05 mm



### Note

*It is not permissible to rework the cylinder heads of diesel engines.*



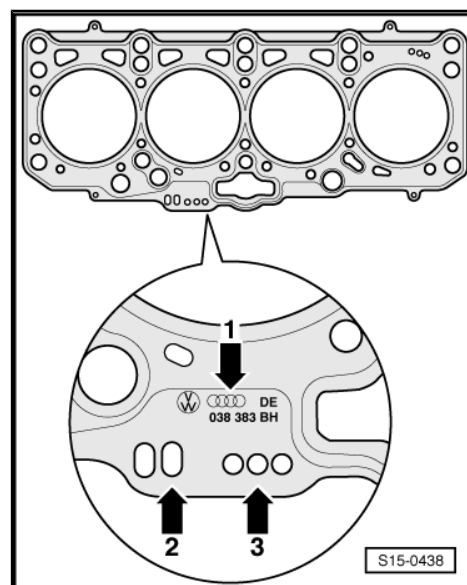
## Identification of the cylinder head gasket

- ◆ Part number = arrow -1-
- ◆ Control code = arrow -2- (ignore)
- ◆ Bores = arrow -3-



### Note

- ◆ *Cylinder head seals of different thicknesses are fitted depending on the piston projection from the cylinder block. If only the gasket is replaced, it must be replaced with a new gasket with the same marking.*
- ◆ *When installing new pistons or a partial engine, determine the piston projection at TDC*  
⇒ [“3.8 inspect piston projection at TDC”, page 91](#).







## 1.4 Removing and installing cylinder head

⇒ ["1.4.1 Removing", page 102](#)

⇒ ["1.4.2 Installing", page 109](#)

### Special tools and workshop equipment required

- ◆ Guide bolt - MP1-208 (3070)-
- ◆ camshaft clamp - T10050-
- ◆ Counterholder - T10051-
- ◆ Extractor - T10052-
- ◆ Socket wrench XZN 10 - T10385-
- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Sealant remover Gasket Stripper (stock code GST, stock item No. R 34402), manufacturer Retech s.r.o.
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Locking agent - D 000 600 A2-
- ◆ Protective goggles and gloves
- ◆ Radiator protection mat - VAS 531003-



#### Caution

*When undertaking all installation work, particularly in the engine compartment due to its cramped construction, please observe the following:*

- ◆ *Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.*
- ◆ *To avoid damage to lines/wiring, ensure sufficient clearance to all moving or hot components.*

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Observe all safety measures and notes for assembly work on the fuel supply and injection system, at the charge air system and observe as well the rules for cleanliness

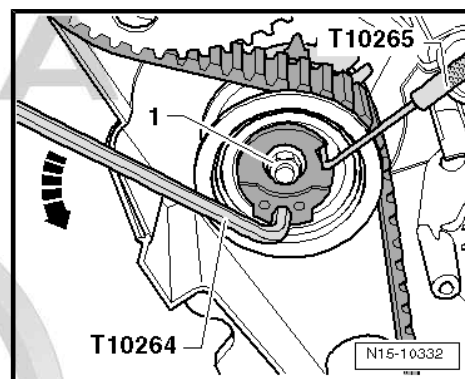
⇒ ["2 Self diagnosis, safety measures, cleanliness regulations and directions", page 2](#) .

### 1.4.1 Removing

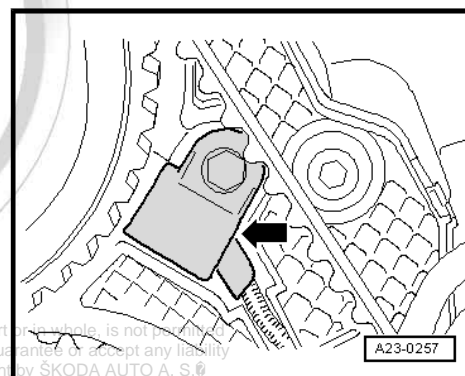
#### Requirements

- Engine temperature should not exceed 35°C, because the cylinder head could be twisted when slackening the screws.
- The pistons must not be in TDC.
- Disconnect the battery-earth strap with the ignition off ⇒ Electrical System; Rep. gr. 27 .
- Remove engine cover  
⇒ ["1.1 Removing and installing engine trim panel", page 7](#) .
- Remove air filter housing with air mass meter - G70- and intake hose  
⇒ ["3.5 Removing and installing air filter housing", page 307](#) .
- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .

- Remove cylinder head cover  
⇒ ["1.2 Removing and installing cylinder head cover", page 96](#) .
- Pull toothed belt off camshaft sprocket  
⇒ ["1.9 Removing and installing toothed belt", page 55](#) .
- Remove rig tool - T10265- .
- Unscrew nut -1-.

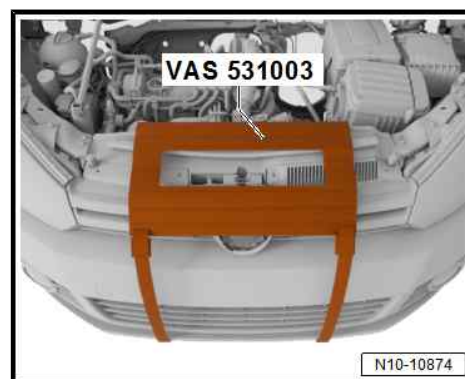


- Unscrew Hall sender - G40- -arrow- and place down.
- Remove camshaft sprocket and pull off hub for camshaft with extractor - T10052-  
⇒ ["2.3 Removing and installing camshafts", page 120](#) .
- Remove fan shroud with radiator fans  
⇒ ["4.2 Removing and installing fan shroud for radiator fan", page 188](#) .



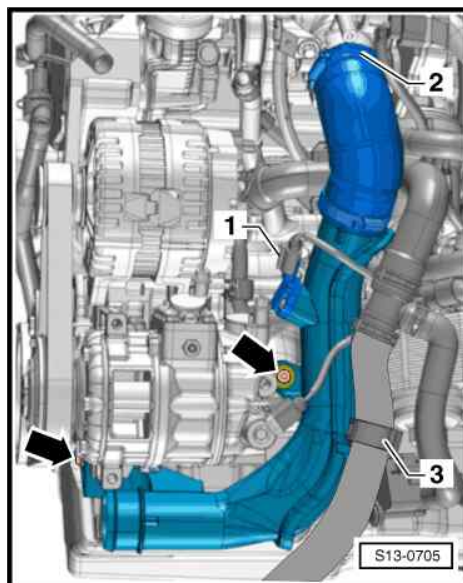
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- Cover radiator with radiator protection mat - VAS 531003- .
- Drain coolant ⇒ ["1.3 Draining and filling coolant", page 163](#) .





- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Loosen hose clamp -2-.
- Disconnect plug -1- at the charge pressure sender - G31- and remove the right charge air pipe.

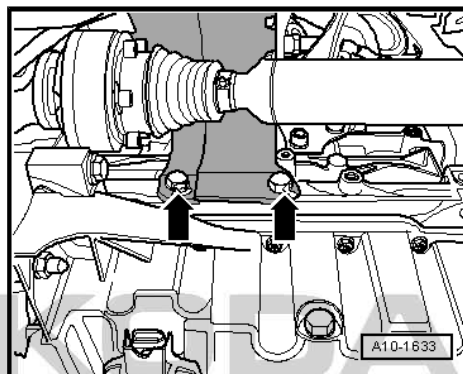


- Unscrew screws -arrows- and remove heat shield for right cardan shaft, if present.

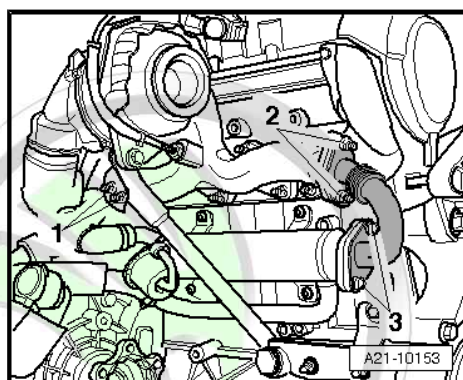


### Caution

*Pay attention that the bellows of the connection pipe is not bent or overstretched. There is a risk of crack formation.*



- Release nuts -2- and screws -3- and remove the connection pipe for exhaust gas recirculation.

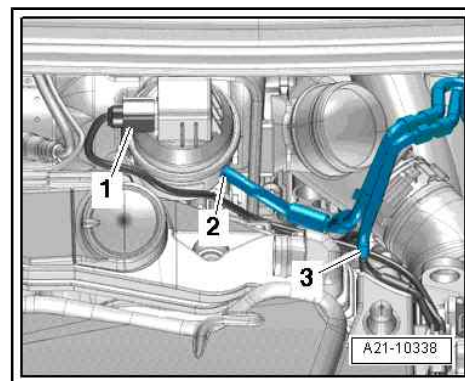


- Disconnect plug connection -1- on the position sender for charge pressure regulator - G581- .
- Remove vacuum hose -2- from vacuum setting element of exhaust turbocharger.
- Disconnect vacuum hose -3-.



### Caution

*The exhaust gas temperature sender 1 - G235- ( temperature sender upstream turbocharger - G507- ) covers the top bolted connection of the support for exhaust turbocharger and must not be bent. For this reason it must be removed.*



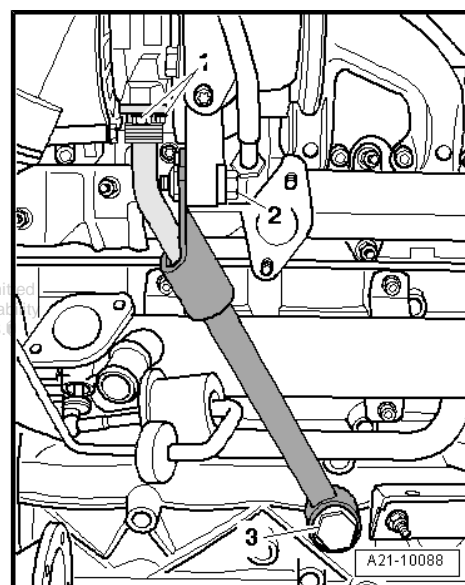
- Remove exhaust gas temperature sender 1 - G235- ( temperature sender upstream turbocharger - G507- )  
⇒ "1.3 Removing and installing exhaust gas temperature sender 1 G235 ( temperature sender upstream turbocharger G507 )", page 245 .

### On vehicles with four-wheel drive

- Remove right flange shaft from angle gearbox ⇒ Gearbox; Rep. gr. 34 .

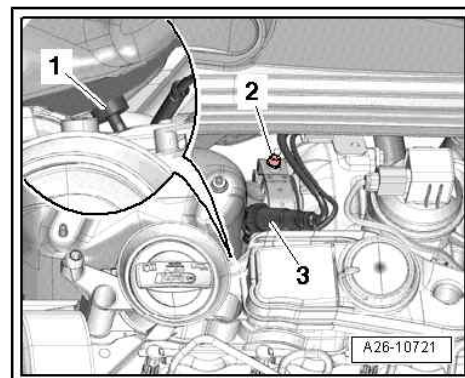
### Continued for all vehicles

- Unscrew screws -1- and -2- and hollow screw -3-.
- Remove support for exhaust turbocharger with oil return-flow line.



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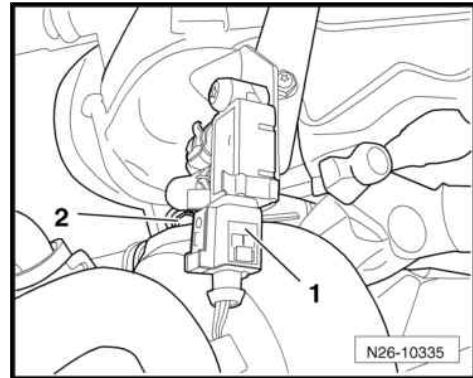
- Slacken screw -2- and remove clamp for diesel particle filter.



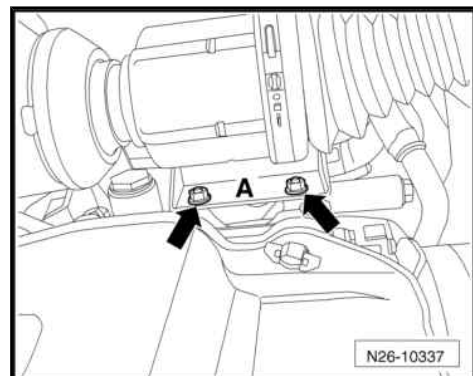




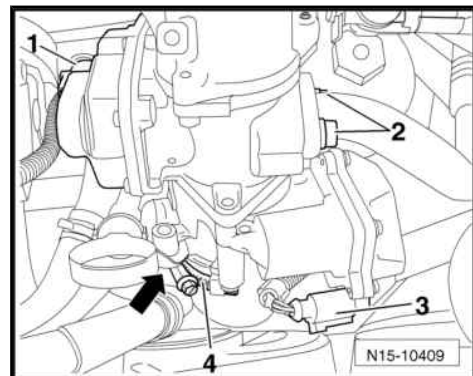
- Release the screw -2- for attaching the diesel particle filter.



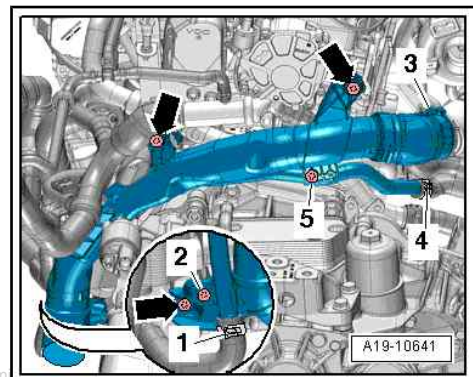
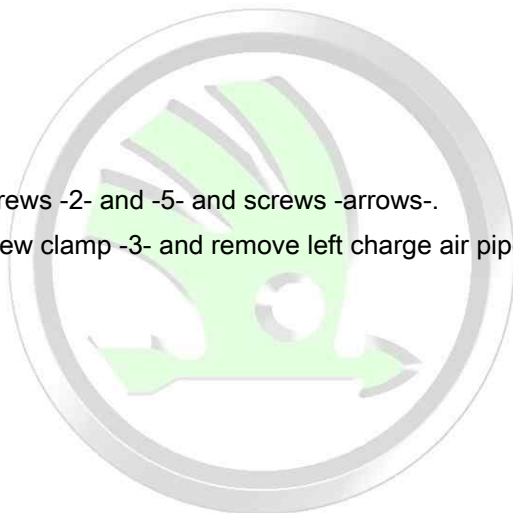
- Unscrew the fixing nuts -arrows- from the bracket for diesel particle filter -A- on the cylinder block and tie up the diesel particle filter to the rear.



- Disconnect the plug -1- on the exhaust gas recirculation valve -N18- and the plug -3- on the throttle valve control unit -J338- .
- Release the screw -arrow- on the oil dipstick guide pipe.
- Release screws -2- on exhaust gas recirculation pipe.

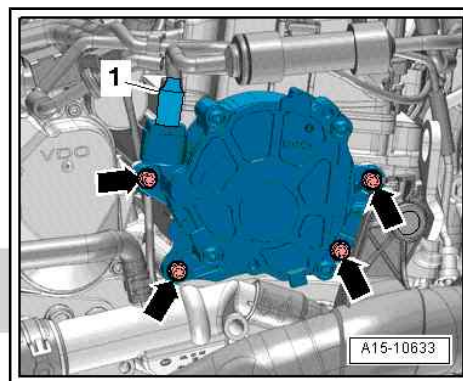


- Unscrew screws -2- and -5- and screws -arrows-.
- Release screw clamp -3- and remove left charge air pipe.

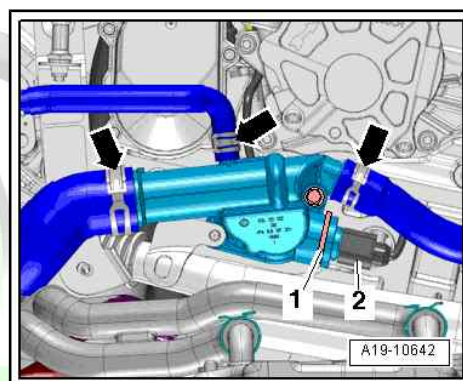


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- Detach the vacuum hose -1- from the vacuum pump.



- Disconnect plug -2- at the coolant temperature sender - G62-.
- Remove the coolant hoses from the connection fittings, to do so slacken the hose clamps -arrows-.

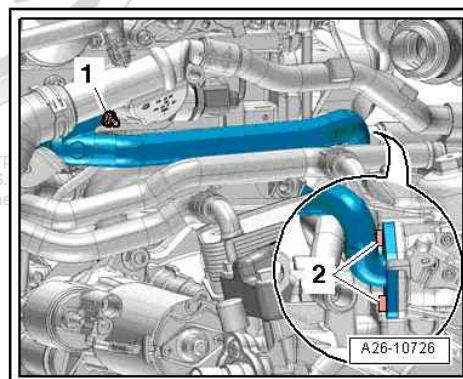


- Release nut -1- and screws -2-, remove exhaust gas recirculation pipe.

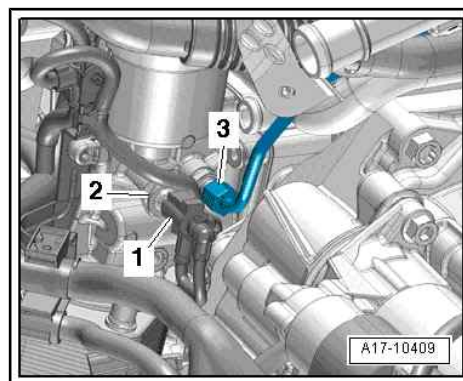


#### Note

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*The bottom screw on the radiator for exhaust gas recirculation can be unscrewed using the socket insert - T10385-.*

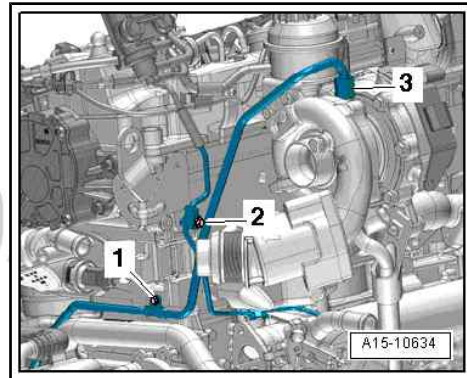


- Unscrew the oil feed line from the connection on the oil filter holder. To do so, hold the assembly spanner on the hexagon and slacken the union nut -3-.

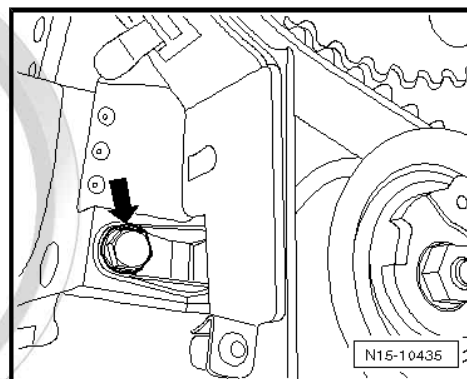




- Release the nut -2- at the retaining clip for the vacuum line.
- Unscrew bolt -1-.
- Unscrew the oil feed line from the connection on the exhaust gas turbocharger. To do so, hold the assembly spanner on the hexagon and slacken the union nut -3-.



- Unscrew screw -arrow- on the timing belt guard at the rear.



- Release the cylinder head bolts in the order -1...10-.

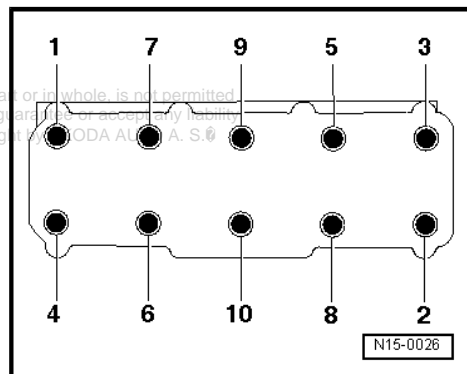


#### Note

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- ◆ A 2nd mechanic is required to remove the cylinder head.
- ◆ The timing belt tensioning pulley is removed from the pin screw when removing the cylinder head.
- ◆ The oil return-flow line for the exhaust gas turbocharger is detached from the support when removing the cylinder head.

- First of all raise the cylinder head at the gearbox side and then pull it out of the rear toothed belt guard. Make sure that the timing belt tensioning pulley does not fall down.



#### Caution

**Risk of damage to the glow plugs when turning the cylinder head.**

- ◆ If the cylinder head is removed with installed glow plugs, do not place it down on the sealing surface since the glow plugs protrude slightly beyond the sealing surface.

- Place the cylinder head so that the oil return-flow line is not bent. If necessary, put a wooden wedge under the exhaust manifold.

## 1.4.2 Installing



### Note

- ◆ *There must not be any oil or coolant present in the blind holes for the cylinder head bolts.*
- ◆ *Replace cylinder head bolts.*
- ◆ *When undertaking assembly replace self-locking nuts and screws as well as gasket rings and gaskets which are tightened through further turning.*
- ◆ *Remove the new cylinder head gasket from its wrapping immediately before fitting.*
- ◆ *Treat the seal with the utmost care. Damage to the silicone layer and in the area of the bead results in leakages.*
- ◆ *When installing an exchange cylinder head with the camshafts installed, it is necessary to oil the contact surfaces between the roller arms and the cams after installing the cylinder head.*
- ◆ *Secure all hose connections with corresponding hose clips.*



### WARNING

***Wear protective gloves when working with sealant and grease remover!***



### Note

*Make sure that when cleaning the cylinder head and cylinder block no foreign bodies can get into the cylinder, the oil and coolant galleries or into the threaded holes.*

- Carefully remove old sealant residue from the cylinder head and cylinder block using a chemical sealant remover.
- Remove the crankshaft arrester - T10050- before placing on the cylinder head and turn the crankshaft in the opposite direction of rotation of engine until all the pistons are approx. at TDC.





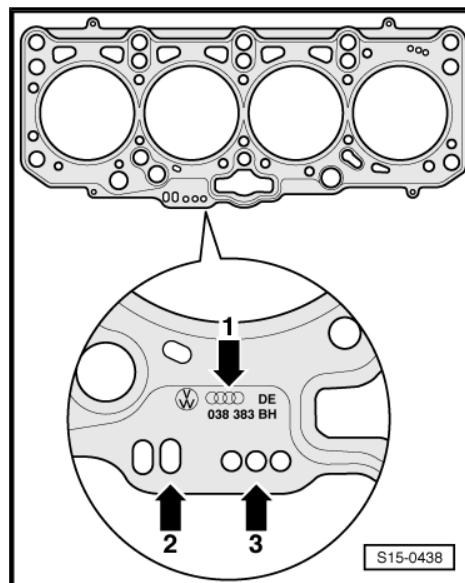
- Pay attention to the identification of the cylinder head seal.
- ◆ Part number = arrow -1-
- ◆ Control code = arrow -2- (ignore)
- ◆ Bores = arrow -3-



**Note**

- ◆ Install a new cylinder head gasket with the same marking, irrespective of whether or not the cylinder head was replaced.
- ◆ If parts of the crankshaft drive were replaced, then the new cylinder head gasket must be redefined by measuring the protrusion of the piston in TDC.

- Position the cylinder head gasket with the marking to the top.



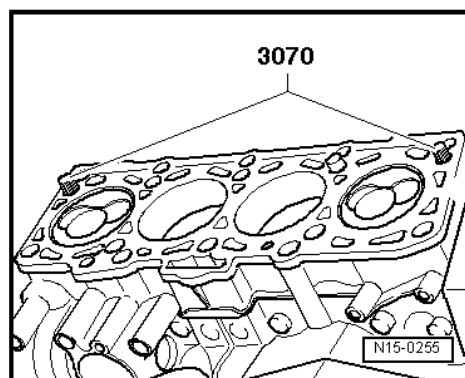
- For centering, screw in guide bolts - MP1-208 (3070)- into the outer holes on the suction side.



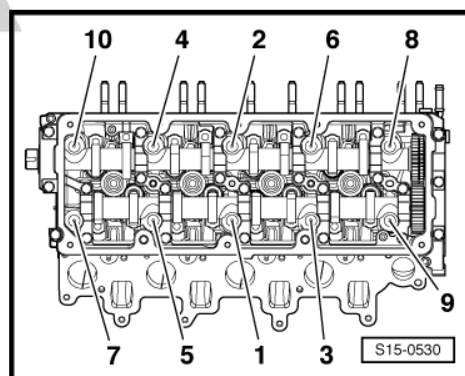
**Note**

The tensioning roller must be fitted onto the pin screw when placing on the cylinder head.

- Fit cylinder head, insert 8 cylinder head bolts and tighten until hand-tight.
- Screw the guide bolts out of the screw holes with a bolt tightener from -MP1-208 (3070)- and screw in the 2 remaining cylinder head screws.
- Tighten cylinder head screws in the order -1 ... 10- in 4 stages as follows:



Stage	Procedure
I	- Pre-tighten with the torque wrench to 30 Nm.
II	- Pre-tighten with the torque wrench to 50 Nm.
III	- Tighten further 90° with a rigid wrench.
IV	- Tighten further 90° with a rigid wrench.



**Note**

Tightening up the cylinder head bolts after doing repair work is not necessary.

Installation is carried out in the reverse order. When installing, note the following:

- Attach rear toothed belt guard to cylinder head.
- Install the hub and the camshaft sprocket.
- Lock the camshaft and the high pressure pump with the rig pins for diesel injection pump - 3359-

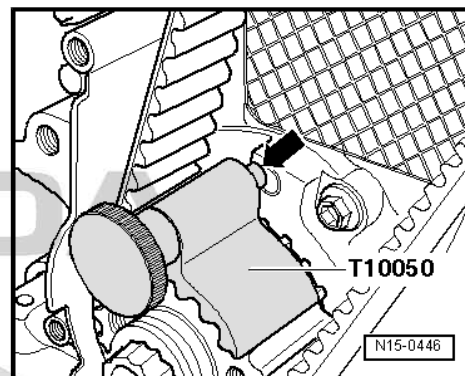
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- Rotate the crankshaft to TDC in direction of rotation of the engine and interlock with the crankshaft arrester - T10050- .
- Fit on the toothed belt  
⇒ [“1.9.2 Installing \(set the timing\)”](#), page 59 .
- Install cylinder head cover  
⇒ [“1.2 Removing and installing cylinder head cover”](#), page 96 .



#### Caution

**Replace all the coolant when installing a new cylinder head**  
⇒ [“1.3 Draining and filling coolant”](#), page 163 .



- Top up coolant  
⇒ [“1.3 Draining and filling coolant”](#), page 163 .
- Perform a test drive, query and erase fault memory of engine control unit ⇒ Vehicle diagnostic tester.



#### Note

*After deleting the event memory of the engine control unit the readiness code must be checked and if necessary re-generated*  
⇒ Vehicle diagnostic tester.

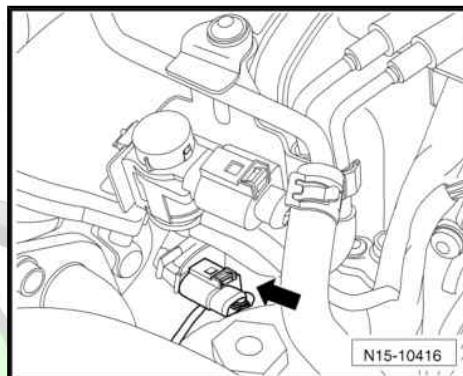
#### Tightening torques

- ◆ Union nut of the oil feed line  
⇒ [“1.4 Summary of components - oil filter holder”](#), page 141 .
- ◆ Charge air pipe Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”](#), page 255 .
- ◆ Charge air pipe Superb II  
⇒ [“2.2 Summary of components - Charge air cooler Superb II”](#), page 256 .
- ◆ Charge air pipe Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”](#), page 257 .
- ◆ Summary of components - exhaust gas turbocharger with component parts  
⇒ [“1.1 Summary of components - exhaust gas turbocharger with component parts”](#), page 237
- ◆ Summary of components - exhaust gas recirculation with radiator  
⇒ [“2.1 Summary of components - Exhaust gas recirculation with radiator”](#), page 328
- ◆ Summary of components - Pre-exhaust pipe with diesel particle filter Octavia II, Superb II, Yeti with engine identification characters CEGA  
⇒ [“1.1 Summary of components - Pre-exhaust pipe with diesel particle filter Octavia II, Superb II, Yeti with engine identification characters CEGA, CBBB”](#), page 313 .
- ◆ Summary of components - Pre-exhaust pipe with diesel particle filter Yeti with engine identification characters CBDB  
⇒ [“1.2 Summary of components - Pre-exhaust pipe with diesel particle filter Yeti with engine identification characters CBDB”](#), page 315

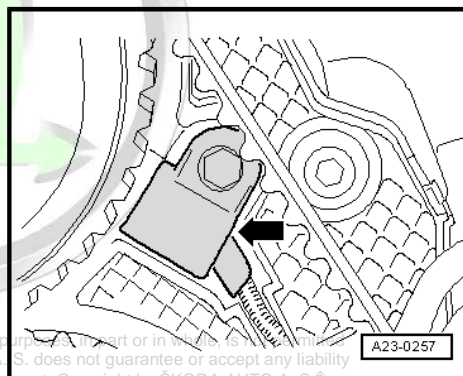
- ◆ Oil feed line for oil filter holder  
⇒ [“1.4 Summary of components - oil filter holder”, page 141](#)

## 1.5 Removing and installing Hall sender - G40-

- Remove toothed belt  
⇒ [“1.9 Removing and installing toothed belt”, page 55](#) .
- Disconnect plug at Hall sender - G40- -arrow-.
- Disconnect the plug from its bracket.



- Unscrew Hall sender - G40- -arrow-.

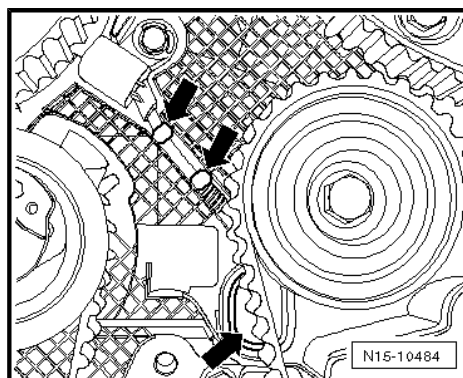


- Remove the legs and the cover of the repair opening -arrows- using a screwdriver.
- Unscrew the Hall sender - G40- from the cylinder head and guide its plug through the repair hole in the toothed belt guard.

### Installing

Installation is carried out in the reverse order. Pay attention to the following:

- ◆ Close the repair hole in the toothed belt guard with a rubber plug ⇒ ETKA - (Electronic Catalogue of Original Parts) .
- install toothed belt and set the timing  
⇒ [“1.9.2 Installing \(set the timing\)”, page 59](#) .



### Tightening torques

- ◆ Fixing screw for hall sender - G40-  
⇒ [“1.3 Summary of components - cylinder head”, page 99](#)

## 1.6 Removing and installing the vacuum pump

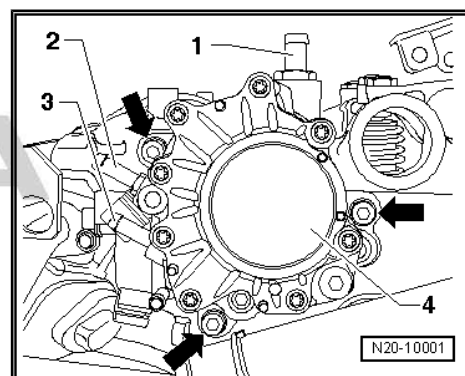


### WARNING

*The vacuum pump must on no account be disassembled, otherwise the proper operation of the pump vacuum part is no longer assured. This will result in a failure of the brake booster.*

### Removing

- Remove air filter housing  
⇒ [“3.5 Removing and installing air filter housing”, page 307](#) .
- Detach the vacuum line to the brake servo unit from the nozzle -1- of the vacuum pump -4-.
- Unscrew the fixing screws of the left charge air pipe and afterwards press the left charge air pipe slightly downwards in order to reach the rear bolted connection of the vacuum pump.



- Unscrew securing bolts -arrows-.
- Remove vacuum pump -4- from cylinder head.

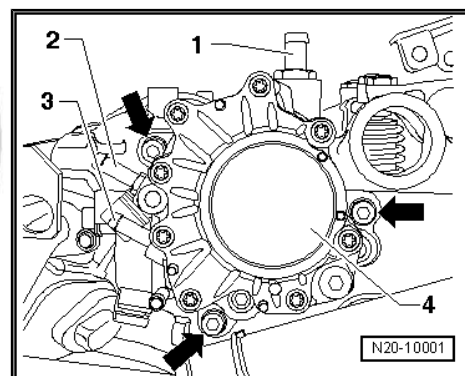
### Installing

Installation is carried out in the reverse order. When installing, observe the following:



### Note

- ◆ Pay attention to the correct position of the coupling for the vacuum pump in the camshaft.
- ◆ Always replace the vacuum pump seals.



- Install the vacuum pump and tighten the securing bolts.
- Connect the vacuum line of the brake servo unit to the nozzle -1- of the vacuum pump.

### Tightening torques

- ◆ Fixing screws of the vacuum pump  
⇒ [“1.3 Summary of components - cylinder head”, page 99](#)

## 1.7 Checking compression



### Note

- ◆ A rough test of the compression pressure can be carried out in the targeted fault finding ⇒ Vehicle diagnostic tester.
- ◆ The following work sequence with the compression tester gives more precise values.





### Special tools and workshop equipment required

- ◆ Compression tester , e.g. -V.A.G 1763-
- ◆ Adapter , e.g. -V.A.G 1381/12-
- ◆ Hinged wrench - 3220-

### Test condition

- Engine oil temperature at least 30 C.

### Test sequence

- Remove the glow plug for the relevant cylinder with the hinged wrench - 3220-  
⇒ ["1.1 Removing and installing glow plugs", page 339](#) .
- Screw in adapter - V.A.G 1381/12- instead of the glow plug.
- Check compression pressure using the compression tester - V.A.G 1763- .



### Note

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Use of tester ⇒ *Operating Instructions*. SKODA AUTO A. S. does not guarantee or accept any liability  
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- Operate starter until the tester no longer indicates a pressure rise.

### Compression readings

New engine pressure	Wear limit pressure	Permissible difference between the cylinders pressure
2.5...3.1 MPa	1.9 MPa	max. 0,5 MPa
25 ... 31 bar	19 bar	max. 5 bar

### After the compression pressure testing

- Re-install the glow plug of the relevant cylinder  
⇒ ["1.1 Removing and installing glow plugs", page 339](#) .
- Querying and erasing event memory of engine control unit  
⇒ Vehicle diagnostic tester.



### Note

*After deleting the event memory of the engine control unit the readiness code must be re-generated.*

## 2 Repairing Valve Gear

- ⇒ [“2.1 Assembly overview - valve gear”, page 115](#)
- ⇒ [“2.2 Replacing camshaft sealing ring”, page 117](#)
- ⇒ [“2.3 Removing and installing camshafts”, page 120](#)
- ⇒ [“2.4 Measuring the axial play of the camshafts”, page 125](#)
- ⇒ [“2.5 Checking hydraulic balancing elements”, page 126](#)
- ⇒ [“2.6 Replacing valve stem seals”, page 127](#)
- ⇒ [“2.7 Valve dimensions”, page 133](#)
- ⇒ [“2.8 inspecting valve guides”, page 133](#)

### 2.1 Assembly overview - valve gear



#### Note

- ◆ *After installing the camshafts, the engine must not be cranked or started for about 30 minutes. The hydraulic clearance compensation elements must settle (otherwise the valves would strike the pistons).*
- ◆ *After carrying out work on the valve gear, carefully crank engine at least 2 revolutions to ensure that no valve touches the piston when the engine is started.*
- ◆ *Always replace gasket rings and seals.*

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## 1 - Sealing ring

- ☐ Do not additionally lubricate or grease sealing lip of the gasket ring
- ☐ Remove oil residue on the camshaft stud with a clean cloth
- ☐ before fitting, cover slot on the camshaft cone with adhesive tape (e.g., with Scotch tape)
- ☐ Removing and installing ⇒ ["2.2 Replacing camshaft sealing ring", page 117](#)

## 2 - Screw

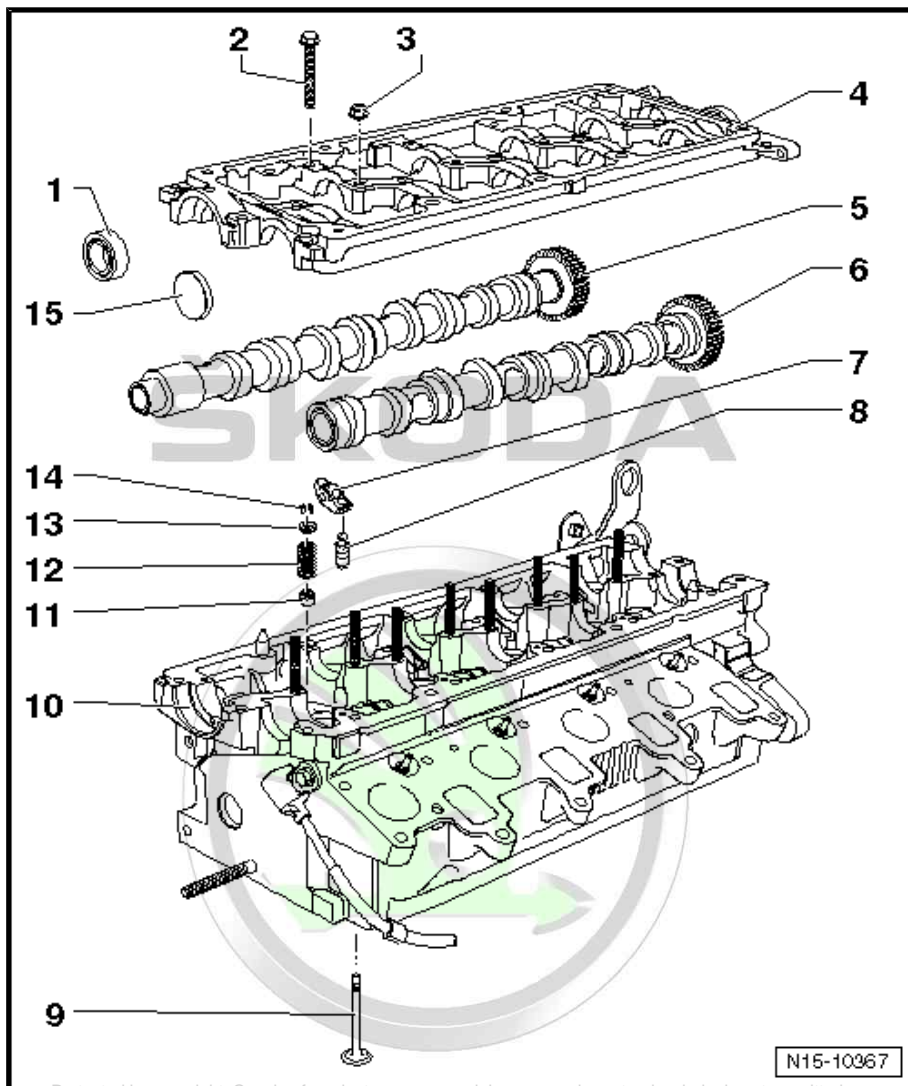
- ☐ Tightening sequence ⇒ ["2.3 Removing and installing camshafts", page 120](#)
- ☐ 10 Nm

## 3 - Nut

- ☐ Tightening sequence ⇒ ["2.3 Removing and installing camshafts", page 120](#)
- ☐ 10 Nm

## 4 - Bearing frame

- ☐ Pay attention to sequence for loosening and tightening ⇒ ["2.3 Removing and installing camshafts", page 120](#)
- ☐ seal with silicone sealant ⇒ ETKA - Electronic Catalogue of Original Parts



## 5 - Camshaft

- ☐ for exhaust valves
- ☐ Removing and installing ⇒ ["2.3 Removing and installing camshafts", page 120](#)
- ☐ Measure axial play ⇒ ["2.4 Measuring the axial play of the camshafts", page 125](#)

## 6 - Camshaft

- ☐ for inlet valves
- ☐ Removing and installing ⇒ ["2.3 Removing and installing camshafts", page 120](#)
- ☐ Measure axial play ⇒ ["2.4 Measuring the axial play of the camshafts", page 125](#)

## 7 - Roller rocker finger

- ☐ Mark installation position
- ☐ Do not interchange
- ☐ Check smooth operation of cylindrical-roller bearings
- ☐ oil contact surfaces

## 8 - Hydraulic supporting element

- ☐ Mark installation position
- ☐ oil the contact surfaces before installing
- ☐ Check ⇒ ["2.5 Checking hydraulic balancing elements", page 126](#)

## 9 - Valve

- ☐ do not rework, only grinding in is permissible
- ☐ mark the fitting position for re-installation
- ☐ Valve dimensions ⇒ ["2.7 Valve dimensions", page 133](#)
- ☐ inspecting valve guides ⇒ ["2.8 inspecting valve guides", page 133](#)

## 10 - Cylinder head

- ☐ pay attention to the notes ⇒ ["1.3 Summary of components - cylinder head", page 99](#)
- ☐ check for distortion ⇒ [page 101](#)
- ☐ Removing and installing ⇒ ["1.4 Removing and installing cylinder head", page 102](#)
- ☐ After replacing, replace all coolant ⇒ ["1.3 Draining and filling coolant", page 163](#)

## 11 - Valve stem gasket

- ☐ replace:
- ◆ with head installed ⇒ ["2.6.1 Replacing the valve stem seals on the installed cylinder head", page 127](#)
- ◆ with head removed ⇒ ["2.6.2 Replacing the valve stem seals on the removed cylinder head", page 130](#)

## 12 - Valve spring

## 13 - Valve spring plate

## 14 - Collets

## 15 - Screw cap

- ☐ Replace after removal
- ☐ Remove: if the bearing frame is built in, insert a screwdriver and lever out
- ☐ Install: drive in flush with a suitable thrust piece without sealant

## 2.2 Replacing camshaft sealing ring

⇒ ["2.2.1 Vehicles up to 08.2009", page 117](#)

⇒ ["2.2.2 Vehicles as of 09/2009", page 119](#)



### Note

*A new gasket ring has been inserted -B- as of 09.2009, on which no closed surface is visible between the camshaft and the cylinder head but rather a hollow rounding is apparent. Here another work procedure must be performed*  
⇒ ["2.2.2 Vehicles as of 09/2009", page 119](#).

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### 2.2.1 Vehicles up to 08.2009

#### Special tools and workshop equipment required

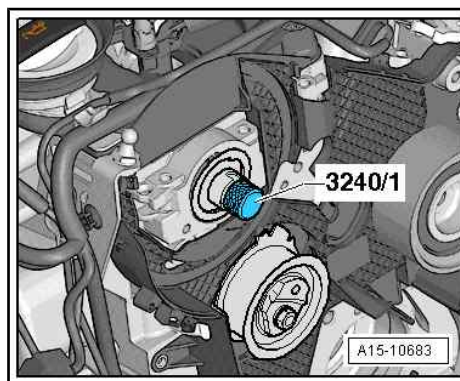
- ◆ Insertion tool - MP1-214 (10-203)-
- ◆ Sealing ring extractor - T30003 (3240)-



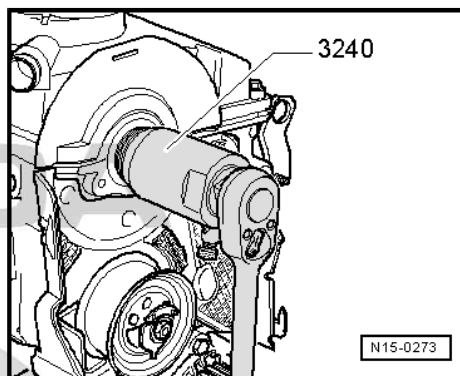
- ◆ Screw M12x1.5x75 from insertion tool - MP1-214 (10-203)-

### Removing

- Pull toothed belt off camshaft sprocket and from toothed belt gear on the high pressure pump  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .
- Remove camshaft sprocket and hub  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .
- Insert thrust piece -3240/1- into the camshaft.
- Turn inner part of gasket ring extractor - 3240- 2 turns (approx. 3 mm) out of the outer part and lock with knurled screw.



- Oil the thread head of the sealing ring extractor, position and fix screw into the sealing ring as far as possible.
- Release knurled screw and turn the inner side against the camshaft until the gasket ring is pulled out.



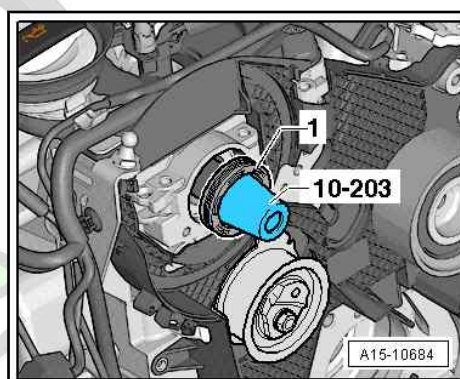
### Installing



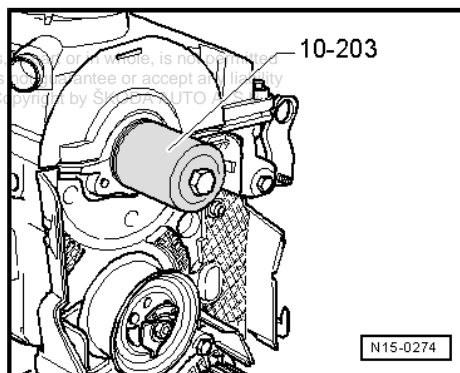
#### Note

*The sealing lip of the gasket ring must neither be oiled nor greased.*

- Fit the guide bushing from -MP1-214 (10-203)- onto the camshaft as shown in the illustration.
- Carefully slide the gasket ring -1- over the guide bushing onto the camshaft.



- Push on the sealing ring with the pressure plate of the insertion tool - MP1-214 (10-203)- and press in screw M12x1.5x75 up to the stop.
- Install the hub and the camshaft sprocket  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .
- Install the toothed belt  
⇒ [“1.9.2 Installing \(set the timing\)”, page 59](#) .

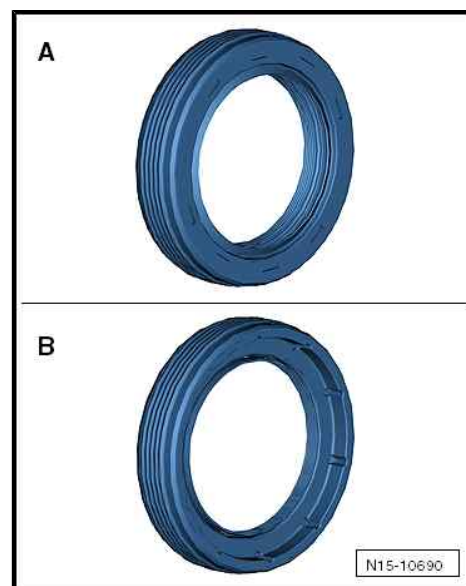


## 2.2.2 Vehicles as of 09/2009



### Note

A new gasket ring has been inserted -B- as of 09.2009, on which no closed surface is visible between the camshaft and the cylinder head but rather a hollow rounding is apparent. For the older version of the gasket ring -A-, a different work procedure must be performed ⇒ ["2.2.1 Vehicles up to 08.2009", page 117](#).



### Special tools and workshop equipment required

- ◆ Insertion tool - MP1-214 (10-203)-
- ◆ Sealing ring extractor - T10443-
- ◆ Screw M12x1.5x75 from insertion tool - MP1-214 (10-203)-

### Removing

- Pull toothed belt off camshaft sprocket and from toothed belt gear on the high pressure pump  
⇒ ["2.3 Removing and installing camshafts", page 120](#).
- Remove camshaft sprocket and hub  
⇒ ["2.3 Removing and installing camshafts", page 120](#).



### WARNING

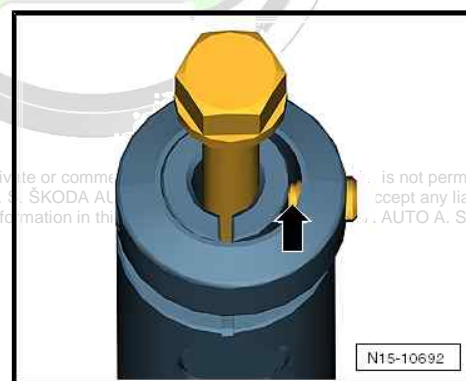
*If it is turned back too much, the inner pressure plate loosens from the pressure screw. In this case, the pressure plate must be pressed onto the pressure screw once again.*

- Turn back the pressure screw of the gasket ring extractor »with fingertip touch« until a slight resistance can be felt.



### Note

The clamping sleeves of the gasket ring extractor have grub screws. However, the clamping occurs by means of only one of these grub screws -arrow- while the other ones are tightly bolted.





- Position the gasket ring extractor straight as shown and screw in the grub screw -A- until the gasket ring extractor clamps.
- Screw in the pressure screw -B- until the gasket ring is pulled out.

#### Installing

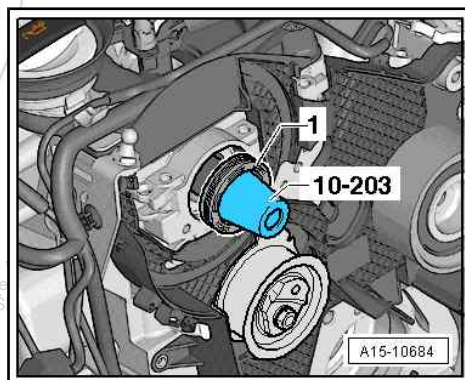
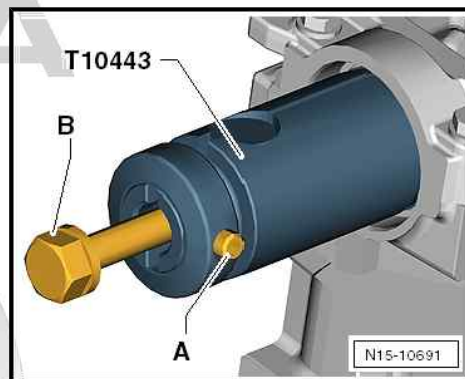


#### Note

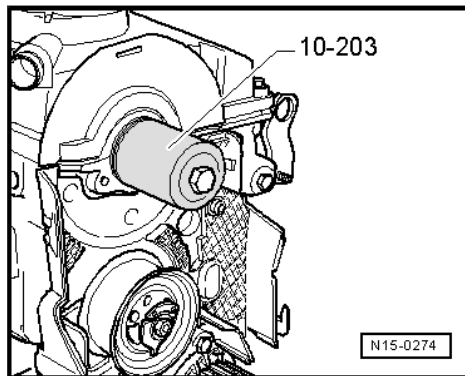
*The sealing lip of the gasket ring must neither be oiled nor greased.*

- Remove oil residue on the camshaft stud with a clean cloth.
- Fit the guide bushing from -MP1-214 (10-203)- onto the camshaft as shown in the illustration. The inscription on the sealing ring points outwards.
- Carefully slide the gasket ring -1- over the guide bushing onto the camshaft.

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- Push on the sealing ring with the pressure plate of the insertion tool - MP1-214 (10-203)- and press in screw M12x1.5x75 up to the stop.
- Install the hub and the camshaft sprocket  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .
- Install the toothed belt  
⇒ [“1.9.2 Installing \(set the timing\)”, page 59](#) .



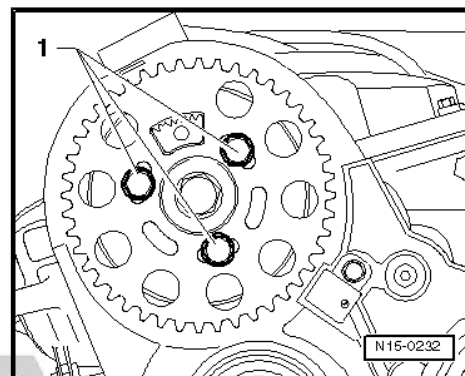
## 2.3 Removing and installing camshafts

### Special tools and workshop equipment required

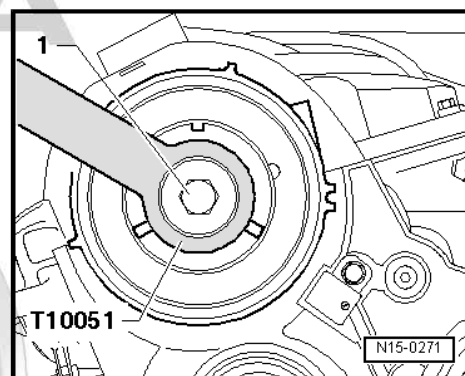
- ♦ Counterholder - T10051-
- ♦ Extractor - T10052-
- ♦ Camshaft-insertion tool - T40094-
- ♦ Camshaft-insertion tool - T40095-
- ♦ Clamping device - T40096/1-
- ♦ Silicone sealant ⇒ ETKA - Electronic catalogue of original parts
- ♦ Sealant remover Gasket Stripper (stock code GST, stock item No. R 34402), manufacturer Retech s.r.o.
- ♦ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ♦ Protective goggles and gloves

## Removing

- Cylinder head fitted.
- Pull toothed belt off camshaft sprocket and from toothed belt gear on the high pressure pump  
⇒ [“1.9 Removing and installing toothed belt”, page 55](#) .
- Remove cylinder head cover  
⇒ [“1.2 Removing and installing cylinder head cover”, page 96](#) .
- Screw out screws -1- and remove camshaft sprocket.



- Slacken screw -1- for the hub of the camshaft, to do so counterhold with counterholder - T10051- .
- Release screw by about 2 turns.



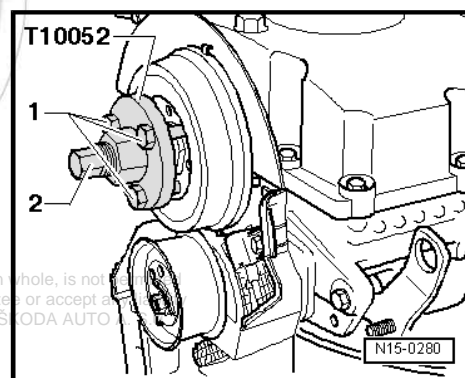
- Position the extractor - T10052- at the hub of the camshaft and screw the screws -1- into the hub.
- Slacken the hub of the toothed belt sprocket from the camshaft cone by uniformly tightening the screw of the extractor -2-.



### Note

*While doing so, hold the extractor firmly using a wrench SW 30.*

- Remove hub from cone of camshaft.
- Remove vacuum pump  
⇒ [“1.6 Removing and installing the vacuum pump”, page 113](#) .







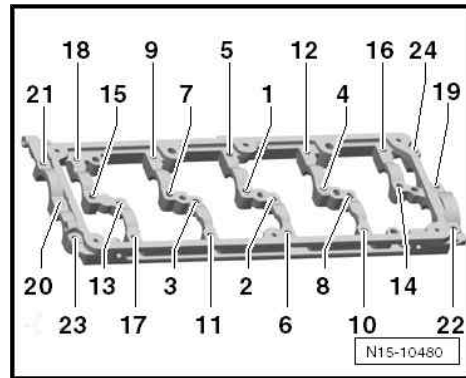
- Loosen the screws for the bearing frame in the sequence -24 ... 1-.
- Unscrew screws and carefully separate the bearing frame from the cylinder head.
- Mark the camshafts for reinstalling and remove.

#### Installing



#### WARNING

*Wear protective gloves and goggles when working with gasket remover and degreasing agent!*



- Remove residual sealant on the bearing frame and cylinder head using a chemical sealant remover.
- Clean sealing surfaces, they must be free of oil and grease.
- Oil contact surfaces of camshafts.

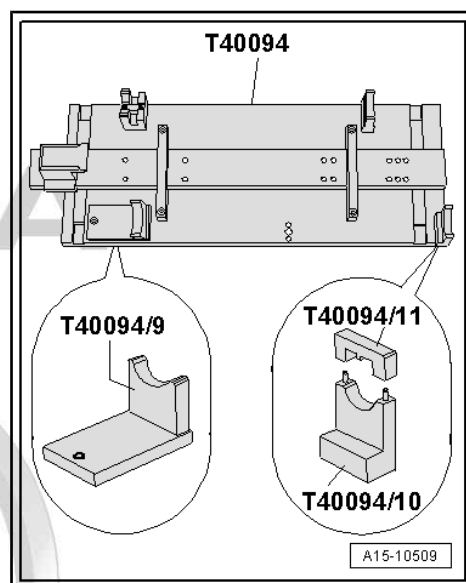


#### Caution

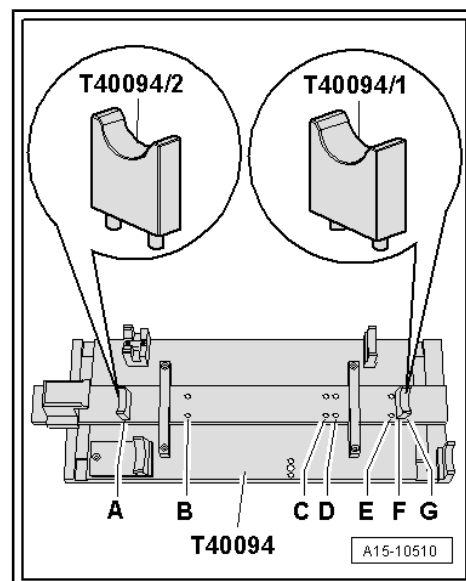
*The camshafts must only be installed using the camshaft-insertion tool - T40094- as described in the following, otherwise the axial bearing in the bearing frame can be destroyed and the cylinder head must be replaced.*

Set up the camshaft-insertion tool - T40094- as follows:

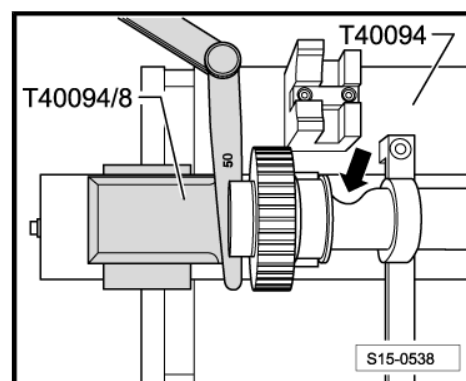
- Tighten the supports -T40094/9- and -T40094/10- (with -T40094/11- ) to the base plate as shown in the illustration. If necessary, remove supports bolted on here.



- Install the support -T40094/1- on plug location -F- and install support -T40094/2- on plug location -A-.
- Insert the inlet camshaft in the supports -T40094/1- and -T40094/2- .



- The protrusion -arrow- of the cylinder head bolt must point to the outside.
- Fit on a feeler gauge of 0.50 mm in order to balance out any play and slide the support -T40094/8- into the groove of the inlet camshaft.



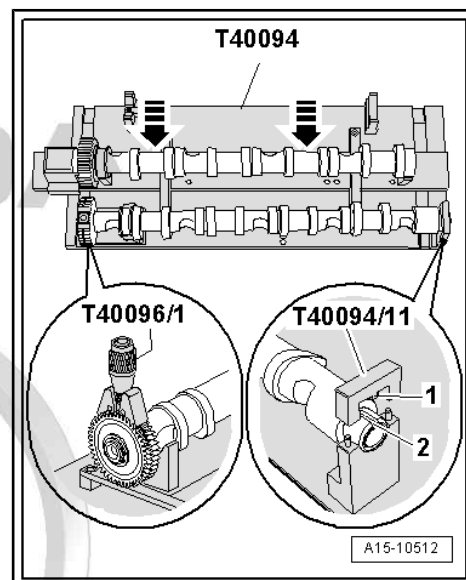
- Insert the exhaust camshaft in the supports -T40094/9- and -T40094/11- .
- Interlock the outlet camshaft with the cover -T40094/11- .
- The peg -1- of the cover must engage in the groove -2- in the camshaft.

#### for camshaft with double gear pinion

- Position the tensioning tool -T40096/1- on the serration of the outlet camshaft in such a way that each leg of the tensioning tool engages into each one half-pinion.
- The wider leg must engage in the wider half-pinion.
- Tension the tensioning tool with the knurled wheel until the tooth flanks are flush with each other.

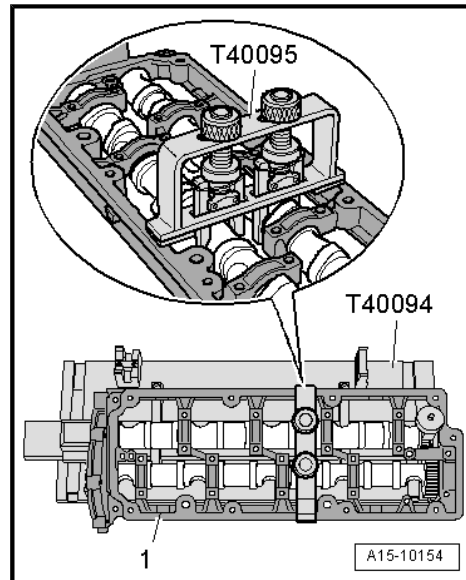
#### Continued for all camshafts

- Slide the inlet camshaft to the outlet camshaft until the serrations are in mesh -arrows-.





- Position the bearing frame onto the camshafts.
- All of the camshaft bearings must rest on the camshafts.
- Position the camshaft-insertion tool - T40095- and fix the camshafts in the bearing frame as shown in the illustration.
- Remove the detent bracket - T40094/11- and pull the support - T40094/8- out of the groove of the inlet camshaft.



**Note**

*Pay attention to the use by date on the silicone sealant.*

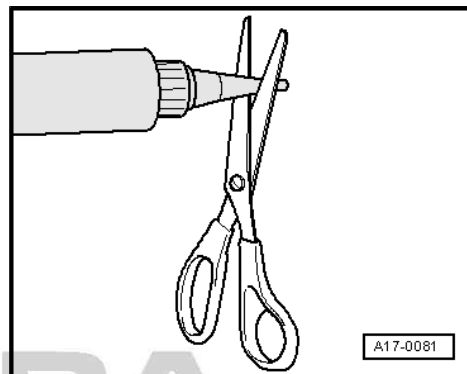
- Cut off nozzle tube at the front marking ( $\varnothing$  of nozzle approx. 2 mm).



**Caution**

***Risk of contamination of the camshaft bearings through excess sealant.***

- ◆ ***Do not apply thicker sealant beads than indicated.***



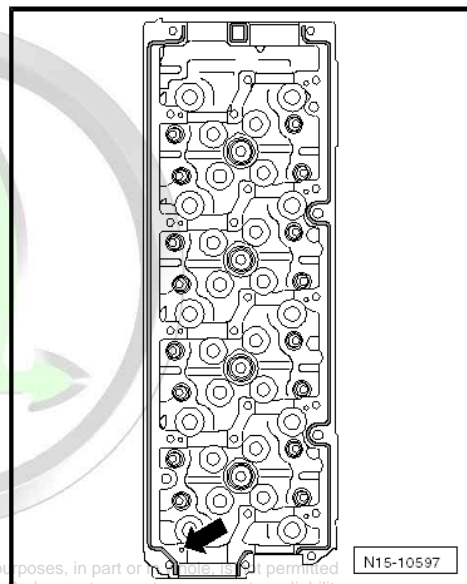
- Apply silicone sealant bead onto the clean sealing surface of the cylinder head as shown in the illustration.
- Thickness of sealant beads: 2...3 mm
- The oil duct for the bearing frame -arrow- must not be clogged with excess sealant.



**Note**

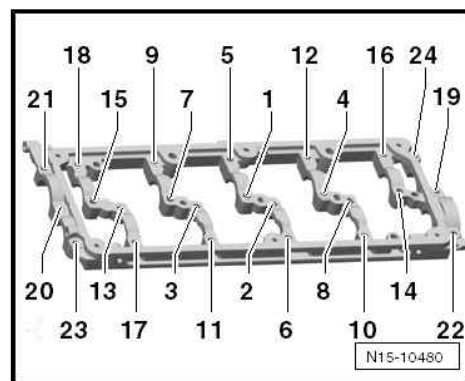
*The bearing frame must be installed within 5 minutes after applying the silicone sealant.*

- Remove camshafts with bearing frame, camshaft insertion tool - T40095- and tensioning tool - T40096/1- from camshaft insertion tool - T40094- and carefully place into the cylinder head.



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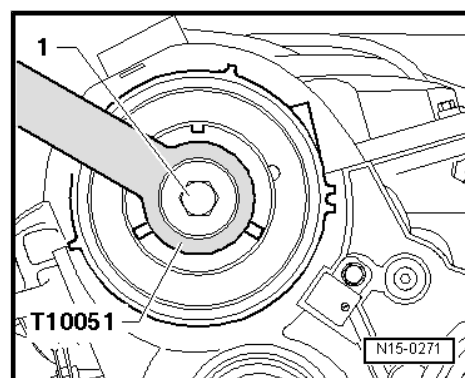
- First of all tighten the screws and the nuts for the bearing frame in the sequence -1°...°24- by hand.
- The bearing frame must rest on the cylinder head with its complete contact surface.
- First of all tighten the screws and the nuts for the bearing frame in the sequence -1°...°24- by hand to the specific torque.
- Remove camshaft insertion tool - T40095- and tensioning tool - T40096/1- if it was used.



- Tighten screw -1- for the hub of the camshaft. To do so counterhold the hub with counterholder - T10051- .

Installation is carried out in the reverse order. When installing, note the following:

- Install camshaft sealing ring  
⇒ [“2.2 Replacing camshaft sealing ring”, page 117](#) .
- Drive in new screw cap  
⇒ [“2.1 Assembly overview - valve gear”, page 115](#) .
- Install vacuum pump  
⇒ [“1.6 Removing and installing the vacuum pump”, page 113](#) .
- Install cylinder head cover  
⇒ [“1.2 Removing and installing cylinder head cover”, page 96](#) .



#### Note

- ◆ *After installing the camshafts, the engine must not be cranked or started for about 30 minutes. The hydraulic clearance compensation elements must settle (otherwise the valves would strike the pistons).*
- ◆ *After carrying out work on the valve gear, carefully crank engine at least two revolutions to ensure that no valve touches the piston when the engine is started.*

#### Tightening torques

- ◆ Screws and nuts for bearing frame  
⇒ [“2.1 Assembly overview - valve gear”, page 115](#)
- ◆ Screw for camshaft hub  
⇒ [“1.8 Assembly overview - toothed belt drive”, page 52](#)

## 2.4 Measuring the axial play of the camshafts

#### Special tools and workshop equipment required

- ◆ Universal dial gauge bracket - MP3-447 (VW 387)-
- ◆ Dial gauge , e.g. -VAS 6079-

#### Work procedure

- Remove bearing frame  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .

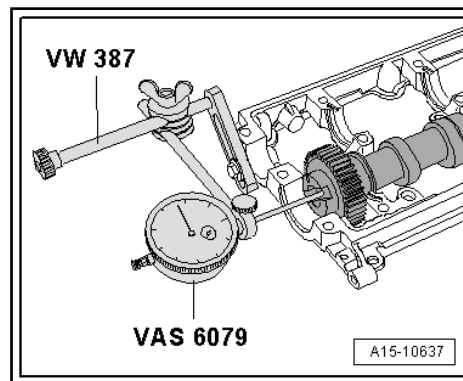




- Attach the dial gauge with the universal dial gauge holder - MP3-447 (VW 387)- to the bearing frame as shown in the illustration.
- Press the camshaft by hand against the dial gauge.
- Position dial gauge to "0".
- Press the camshaft off the dial gauge and read the value.

Axial play of inlet camshaft and outlet camshaft:

- Set value: 0.048-0.118 mm
- Wear limit: 0,17 mm



## 2.5 Checking hydraulic balancing elements



### Note

- ◆ *The hydraulic balancing elements cannot be repaired.*
- ◆ *Irregular valve noises when starting engine are normal.*
- ◆ *If the irregular valve noises disappear but occur regularly during short journeys, then the oil pressure must be checked*  
⇒ *["1.13 Testing oil pressure and oil pressure switch", page 157](#).*
- ◆ *The valve for oil pressure control is integrated in the oil filter holder.*

### Special tools and workshop equipment required

- ◆ Feeler gauge

### Work procedure

- Start engine and allow to run until the radiator fan starts.
- Increase speed to about 2500 rpm for 2 minutes and undertake a test drive if necessary.

If the valve noises occur irregularly, determine the defective hydraulic balancing element as follows:

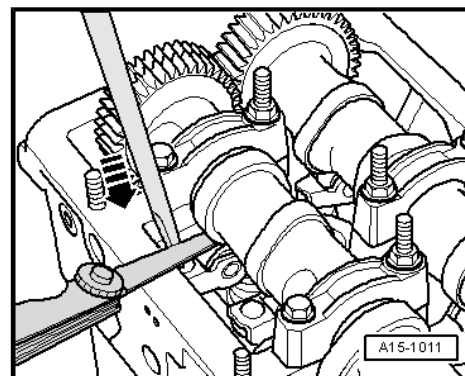
- Remove cylinder head cover  
⇒ *["1.2 Removing and installing cylinder head cover", page 96](#).*
- Turn the crankshaft until the cam of the hydraulic balancing element to be tested is positioned on top.

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- Press down the hydraulic balancing element using a wooden or plastic wedge.
- Determine the play between the cam and the roller of the valve lever.

If a 0.20 mm feeler gauge can be slipped between the cam and the roller of the valve lever, the hydraulic balancing element is defective:

- Replace the hydraulic balancing element. To do so, remove camshafts  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .



#### Note

- ◆ *After installing the camshafts, the engine must not be started for about 30 minutes. The hydraulic clearance compensation elements must settle (otherwise valves would strike the pistons).*
- ◆ *After carrying out work on the valve gear, carefully crank engine at least two revolutions to ensure that no valve touches the piston when the engine is started.*

## 2.6 Replacing valve stem seals

⇒ [“2.6.1 Replacing the valve stem seals on the installed cylinder head”, page 127](#)

⇒ [“2.6.2 Replacing the valve stem seals on the removed cylinder head”, page 130](#)

### 2.6.1 Replacing the valve stem seals on the installed cylinder head

#### Special tools and workshop equipment required

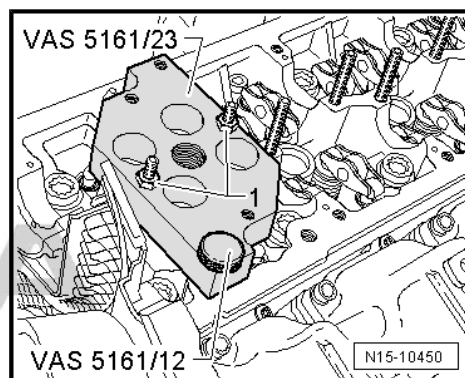
- ◆ Valve stem seal extractor - MP1-230 (3364)-
- ◆ valve stem seal insertion tool - MP1-233 (3365)-
- ◆ Disassembly and assembly device for valve collets - VAS 5161 A- with knurled spacer ring -VAS 5161/23-1- and guide plate -VAS 5161/23-

#### Work procedure

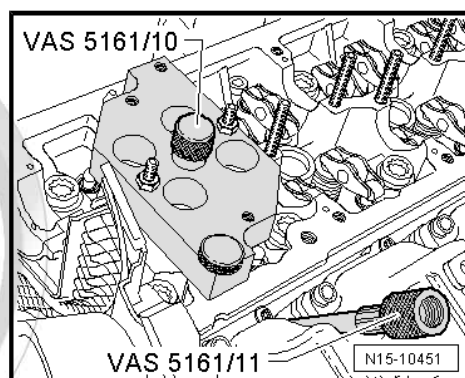
- Remove all glow plugs  
⇒ [“1.1 Removing and installing glow plugs”, page 339](#) .
- Remove the camshafts  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .
- When installing again, mark the assignment of the roller rocker arms and the hydraulic clearance compensation elements.
- Remove the roller rocker arms together with the hydraulic balancing elements and lay aside on a clean surface.
- Put the piston of the relevant cylinder at “bottom dead centre”.



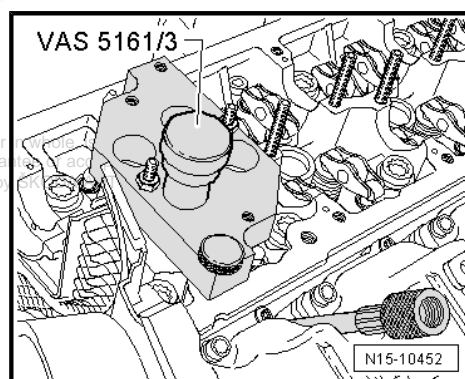
- Position the guide plate -VAS 5161/23- onto the cylinder head.
- Screw the guide plate to the side of the intake manifold with the knurled screw -VAS 5161/12- and to the pin screws with 2 nuts M6 without collar -1- by hand until it fits on tightly.



- Screw the sealing bolt -VAS 5161/10- into the guide plate.
- Screw the adapter -VAS 5161/11- into the relevant pencil type glow plug thread by hand.

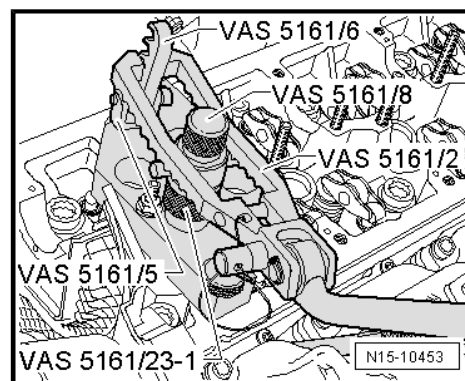


- Insert the impact drift -VAS 5161/3- into the guide plate and knock off the tightly fitted valve collets using a plastic hammer.

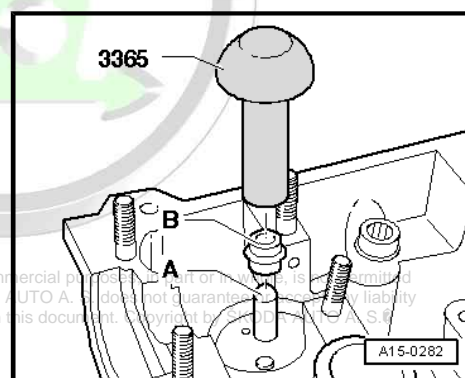
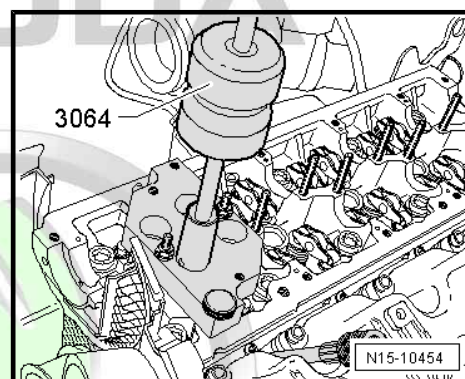


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- Screw the detent part -VAS 5161/6- with the interlocking fork -VAS 5161/5- into the guide plate.
- Push knurled spacer ring -VAS 5161/23-1- onto the assembly cartridge -VAS 5161/8- .
- Connect the adapter to the compressed air with a commercially available intermediate piece and apply constant pressure.
  - Minimum pressure: 0.6 MPa (6 bar)
- Hook the pressure fork -VAS 5161/2- onto the detent part and push the assembly cartridge downwards.
- Turn simultaneously the knurled screw of the assembly cartridge to the right, until the tips click into the valve collets.
- Rotate the knurled screw to the left and to the right, by doing so the valve collets are pressed apart and are installed in the assembly cartridge.
- Release the pressure fork.
- Remove assembly cartridge with knurled spacer ring.
- Remove the valve spring with the valve spring retainer.
- Pull off valve stem seal with the valve stem seal extractor -3364- .

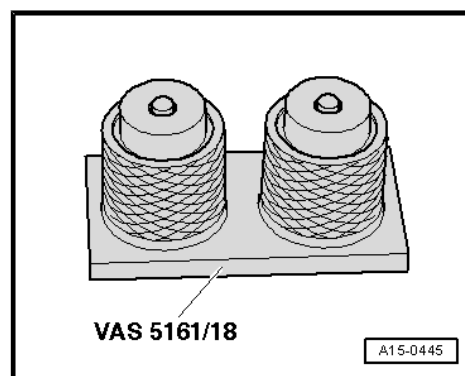


- Fit the plastic bushing -A-, which is attached to the new valve stem seals -B-, onto the valve stem.
- Lightly oil sealing lip of the new valve stem seal.
- Slide the valve stem seal onto the plastic bushing.
- Carefully press the valve stem seal with the valve stem seal insertion tool - 3365- onto the valve guide.
- Remove plastic sleeve.



If the valve collets were removed from the assembly cartridge, first of all they must be inserted into the insertion device -VAS 5161/18- .

- The large diameter of the valve collets points to the top.
- Insert the valve spring and the valve spring retainer.
- Press the assembly cartridge from the top onto the insertion device for valve collets and lift up the valve collets.



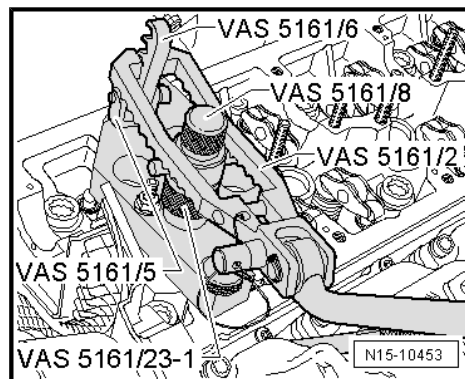




- Re-insert the assembly cartridge into the guide plate - VAS 5161/23- .
- Press down the pressure fork and turn the knurled screw to the left while pulling it upwards, by doing so the valve collets are inserted.
- Release the pressure fork on tightened knurled screw.
- Repeat the procedure for each valve.

#### Assembling

Assembly is carried out in the reverse order. When installing, observe the following:



#### Note

*Ensure that all the roller arms are correctly positioned on the valve stem ends and are clipped in place on the relevant hydraulic balancing elements.*

- Install camshafts  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .
- Install glow plugs  
⇒ [“1.1 Removing and installing glow plugs”, page 339](#) .

## 2.6.2 Replacing the valve stem seals on the removed cylinder head

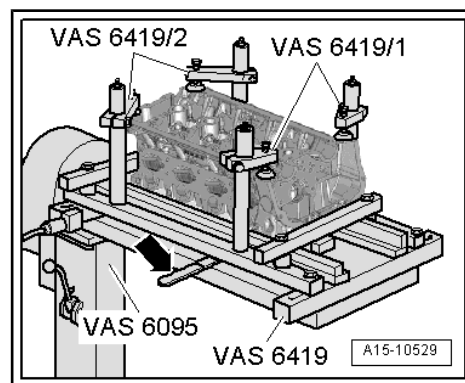
#### Special tools and workshop equipment required

- ◆ Engine and gearbox mount - VAS 6095-
- ◆ Cylinder head tensioning device - VAS 6419-
- ◆ Disassembly and assembly device for valve collets - VAS 5161 A- with knurled spacer ring -VAS 5161/23-1- and guide plate -VAS 5161/23-
- ◆ Valve stem seal extractor - MP1-230 (3364)-
- ◆ valve stem seal insertion tool - MP1-233 (3365)-
- ◆ Nut M6 without collar (2 pieces)

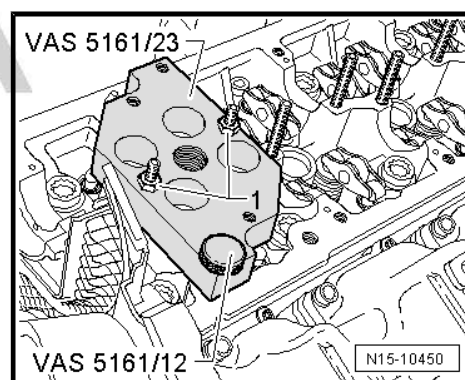
#### Work procedure

- Remove glow plugs  
⇒ [“1.1 Removing and installing glow plugs”, page 339](#) .
- Remove the camshafts  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .
- Remove cylinder head  
⇒ [“1.4 Removing and installing cylinder head”, page 102](#) .
- Insert the cylinder head tensioning device - VAS 6419- into the engine and gearbox jack - VAS 6095- .

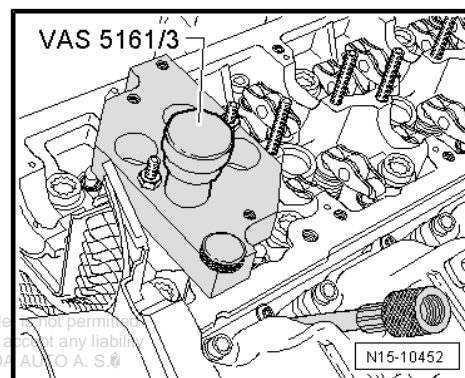
- Tension the cylinder head in the cylinder head tensioning device, as shown in the illustration.
- Connect cylinder head tensioning device to compressed air.
- Adjust the air bellows with the lever -arrow- below the combustion chamber on which the valve stem seals should be removed.
- Allow just enough air to flow into the air bag so that it applied to the valve disc.



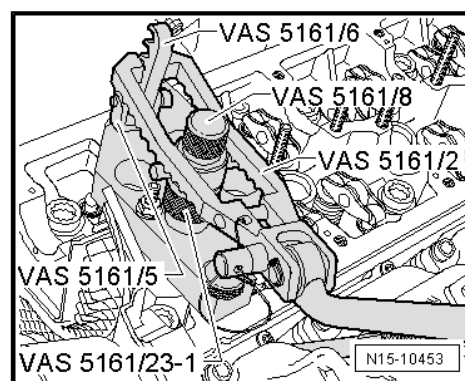
- Position the guide plate -VAS 5161/23- onto the cylinder head.
- Screw the guide plate to the side of the intake manifold with the knurled screw -VAS 5161/12- and to the pin screws with 2 nuts M6 without collar -1- by hand until it fits on tightly.



- Insert the impact drift -VAS 5161/3- into the guide plate and knock off the tightly fitted valve collets using a plastic hammer.

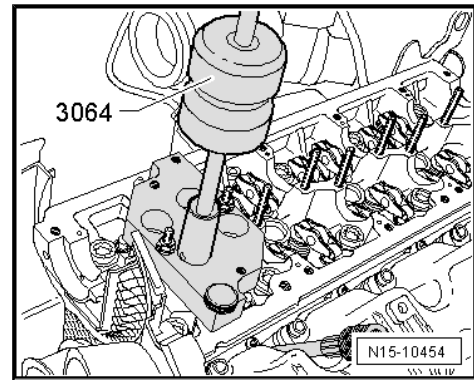


- Screw the detent part -VAS 5161/6- with the interlocking fork -VAS 5161/5- into the guide plate.
- Push knurled spacer ring -VAS 5161/23-1- onto the assembly cartridge -VAS 5161/8- .
- Hook the pressure fork -VAS 5161/2- onto the detent part and push the assembly cartridge downwards.
- Turn simultaneously the knurled screw of the assembly cartridge to the right, until the tips click into the valve collets.
- Rotate the knurled screw to the left and to the right, by doing so the valve collets are pressed apart and are installed in the assembly cartridge.
- Release the pressure fork.
- Remove assembly cartridge with knurled spacer ring.
- Remove the valve spring with the valve spring retainer.

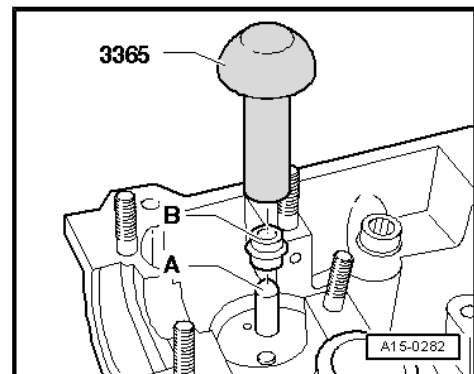




- Pull off valve stem seal with the valve stem seal extractor - 3364- .

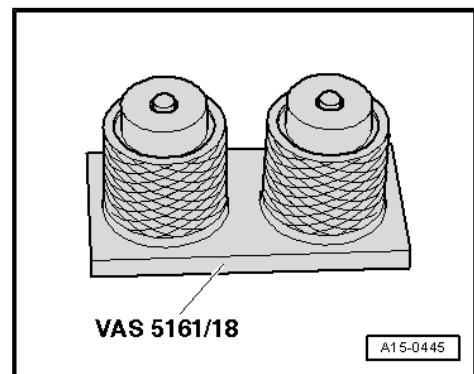


- Fit the plastic bushing -A-, which is attached to the new valve stem seals -B-, onto the valve stem.
- Lightly oil sealing lip of the new valve stem seal.
- Slide the valve stem seal onto the plastic bushing.
- Carefully press the valve stem seal with the valve stem seal insertion tool - 3365- onto the valve guide.
- Remove plastic sleeve.



If the valve collets were removed from the assembly cartridge, first of all they must be inserted into the insertion device - VAS 5161/18- .

- The large diameter of the valve collets points to the top.
- Insert the valve spring and the valve spring retainer.
- Press the assembly cartridge from the top onto the insertion device for valve collets and lift up the valve collets.



- Re-insert the assembly cartridge into the guide plate - VAS 5161/23- .
- Press down the pressure fork and turn the knurled screw to the left while pulling it upwards, by doing so the valve collets are inserted.
- Release the pressure fork on tightened knurled screw.
- Repeat the procedure for each valve.

### Assembling

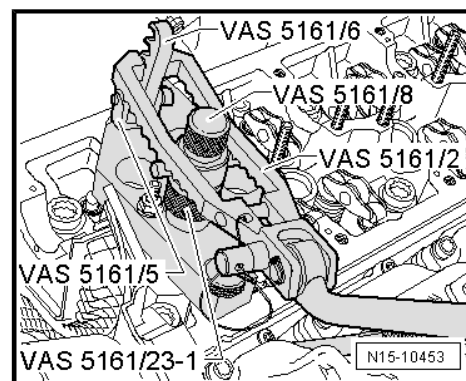
Assembly is carried out in the reverse order. When installing, observe the following:



### Note

*Ensure that all the roller arms are correctly positioned on the valve stem ends and are clipped in place on the relevant hydraulic balancing elements.*

- Install cylinder head  
⇒ [“1.4 Removing and installing cylinder head”, page 102](#) .
- Install camshafts  
⇒ [“2.3 Removing and installing camshafts”, page 120](#) .
- Install glow plugs  
⇒ [“1.1 Removing and installing glow plugs”, page 339](#) .



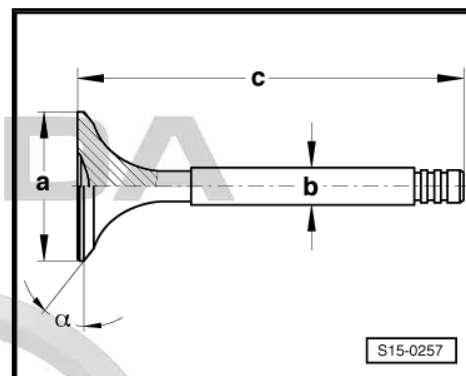
## 2.7 Valve dimensions

Dimension		Inlet valve	Exhaust valve
Ø a	mm	28.10	26.00
Ø b	mm	5.975	5.965
c	mm	99.30	99.10
α	°	45	45



### Note

*Valves must not be reworked. Only lapping-in is permitted.*



## 2.8 inspecting valve guides

### Special tools and workshop equipment required

- ♦ Universal dial gauge bracket - MP3-447 (VW 387)-
- ♦ Dial gauge , e.g. -VAS 6079-



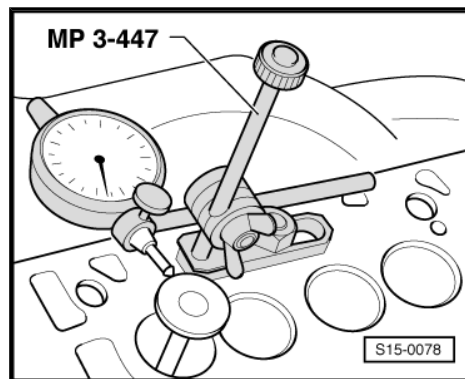


## Test sequence



### Note

- ◆ *If the valves are replaced when carrying out repair work, use new valves for the measurement.*
- ◆ *Because of the different stem diameters only use inlet valve in inlet guide or outlet valve in outlet guide.*
- Insert valve into valve guide. End of valve stem must be flush with guide.
- Valve rock: max. 1.0 mm.



### Note

*If the wear limit is exceeded, repeat measurement with new valves. If the wear limit is again exceeded, replace cylinder head. The valve guides cannot be changed.*

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## 17 – Lubrication

### 1 Lubrication system

⇒ [“1.1 Summary of components - Parts of the lubrication system Octavia II, Yeti”, page 135](#)

⇒ [“1.2 Summary of components - Parts of the lubrication system Superb II”, page 138](#)

⇒ [“1.3 Removing and installing oil level and oil temperature sender G266”, page 141](#)

⇒ [“1.4 Summary of components - oil filter holder”, page 141](#)

⇒ [“1.5 Removing and installing oil pan”, page 143](#)

⇒ [“1.6 Removing and installing oil pump Octavia II, Yeti”, page 146](#)

⇒ [“1.7 Removing and installing oil pump Superb II”, page 147](#)

⇒ [“1.8 Removing and installing balancing shaft module Superb II”, page 148](#)

⇒ [“1.9 Installing new balancing shaft module Superb II”, page 149](#)

⇒ [“1.10 Re-installing the already used balancing shaft module Superb II”, page 151](#)

⇒ [“1.11 Removing and installing oil pressure switch F1”, page 153](#)

⇒ [“1.12 Removing and installing the oil filter holder with the engine oil cooler”, page 153](#)

⇒ [“1.13 Testing oil pressure and oil pressure switch”, page 157](#)



#### Note

- ◆ *If considerable quantities of metal swarf as well as abrasion is found in the engine oil when carrying out engine repairs, carefully clean the oil galleries in order to avoid consequential damage and additionally replace the engine oil cooler as well as the oil filter element.*
- ◆ *The oil level must not be above the max. marking - risk of damage to catalytic converter!*

Check the engine oil, amount of oil and oil specification:

◆ ⇒ Maintenance ; Booklet Octavia II .

◆ ⇒ Maintenance ; Booklet Superb II .

◆ ⇒ Maintenance ; Booklet Yeti .

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### 1.1 Summary of components - Parts of the lubrication system Octavia II, Yeti



# 1 - Screw

- ☐ Pay attention to the procedure for tightening  
⇒ ["1.5 Removing and installing oil pan", page 143](#)

- ☐ 15 Nm

# 2 - Drive chain sprocket

- ☐ at the crankshaft
- ☐ Replace  
⇒ ["3.5 Replacing the drive chain sprocket Octavia II, Yeti", page 84](#)

# 3 - Dipstick

- ☐ Oil level must not exceed max. marking

# 4 - Hopper

- ☐ The funnel and the guide pipe are one component part
- ☐ Tightening torque  
⇒ [page 138](#)

# 5 - Guide tube

- ☐ The funnel and the guide pipe are one component part
- ☐ Tightening torque  
⇒ [page 138](#)

# 6 - Oil spray jet

- ☐ for piston cooling
- ☐ Removing and installing  
⇒ [page 91](#)

# 7 - Pressure valve

- ☐ opens at a pressure of 0.25...0.32 MPa (2.5...3.2 bar)
- ☐ replace without sealant
- ☐ Removing and installing ⇒ [page 91](#)
- ☐ 27 Nm

# 8 - O-ring

- ☐ Replace after removal

# 9 - Intake manifold

- ☐ Clean strainer if dirty

# 10 - Baffle

# 11 - Left charge air pipe

- ♦ Octavia II ⇒ ["2.1 Summary of components - Charge air cooler Octavia II", page 255](#)

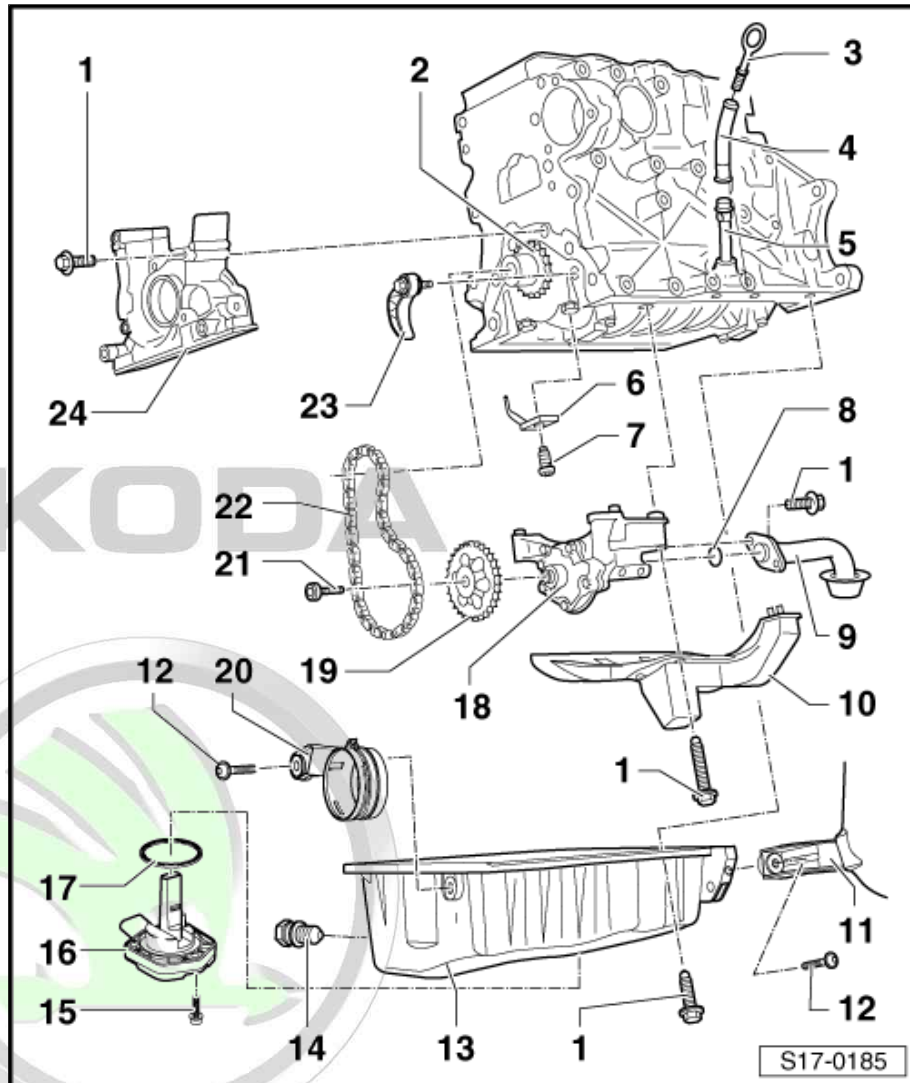
- ♦ Yeti ⇒ ["2.3 Summary of components - Charge air cooler Yeti", page 257](#)

# 12 - Screw

- ☐ 8 Nm

# 13 - Oil pan

- ☐ Removing and installing ⇒ ["1.5 Removing and installing oil pan", page 143](#)
- ☐ install with silicone sealant ⇒ ETKA - Electronic catalogue of original parts



#### 14 - Drain plug

- ☐ with integrated sealing ring
- ☐ Replace after removal
- ☐ 30 Nm

#### 15 - Screw

- ☐ Replace after removal
- ☐ 10 Nm

#### 16 - Oil level and oil temperature sender - G266-

- ☐ Removing and installing  
⇒ ["1.3 Removing and installing oil level and oil temperature sender G266", page 141](#)

#### 17 - O-ring

- ☐ Replace after removal

#### 18 - Oil pump

- ☐ with safety valve 1,2 MPa (12 bar)
- ☐ Removing and installing ⇒ ["1.6 Removing and installing oil pump Octavia II, Yeti", page 146](#)
- ☐ before installing, check whether both dowel sleeves are present
- ☐ if there is any scoring on the contact surfaces of the gears, replace
- ☐ Tightening torque of oil pump cover at oil pump housing: 10 Nm

#### 19 - Oil pump sprocket

- ☐ Fits onto oil pump shaft in one position only

#### 20 - Right charge air pipe

- ◆ Octavia II ⇒ ["2.1 Summary of components - Charge air cooler Octavia II", page 255](#)
- ◆ Yeti ⇒ ["2.3 Summary of components - Charge air cooler Yeti", page 257](#)

#### 21 - Screw

- ☐ 25 Nm

#### 22 - Oil pump chain

- ☐ before removing mark running direction
- ☐ check for wear

#### 23 - Chain tensioner

- ☐ do not disassemble
- ☐ Replace chain tensioner if spring is broken
- ☐ Check fitting position
- ☐ When installing, hook on the spring and pretension
- ☐ 16 Nm

#### 24 - Sealing flange on the belt pulley side

- ☐ must be positioned on dowel sleeves
- ☐ Removing and installing  
⇒ ["2.3 Removing and installing the sealing flange on the belt pulley side", page 67](#)
- ☐ install with silicone sealant ⇒ ETKA - Electronic catalogue of original parts
- ☐ Replace crankshaft seal on belt pulley side  
⇒ ["2.2 Replacing crankshaft sealing ring on the belt pulley side", page 66](#)

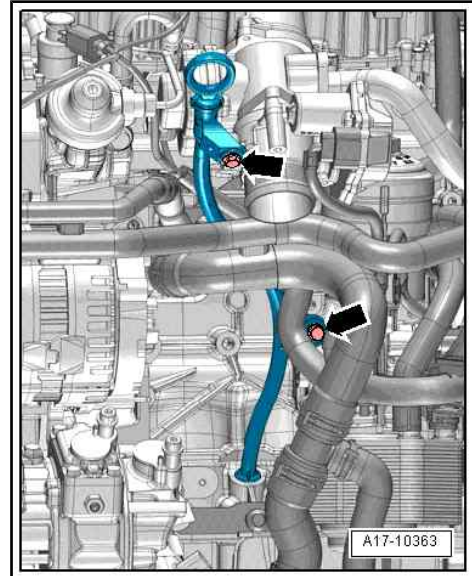
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### Oil dipstick guide pipe - tightening torque

- Tighten screws -arrows- to 9 Nm.



## 1.2 Summary of components - Parts of the lubrication system Superb II

### 1 - Sealing ring

- ☐ Component part of the drain plug

### 2 - Drain plug

- ☐ with integrated sealing ring
- ☐ Replace after removal
- ☐ 30 Nm

### 3 - Oil pan

- ☐ Removing and installing  
⇒ ["1.5 Removing and installing oil pan"](#),  
[page 143](#)
- ☐ install with silicone sealant ⇒ ETKA - Electronic catalogue of original parts

### 4 - Screw

- ☐ 10 Nm

### 5 - Intake manifold

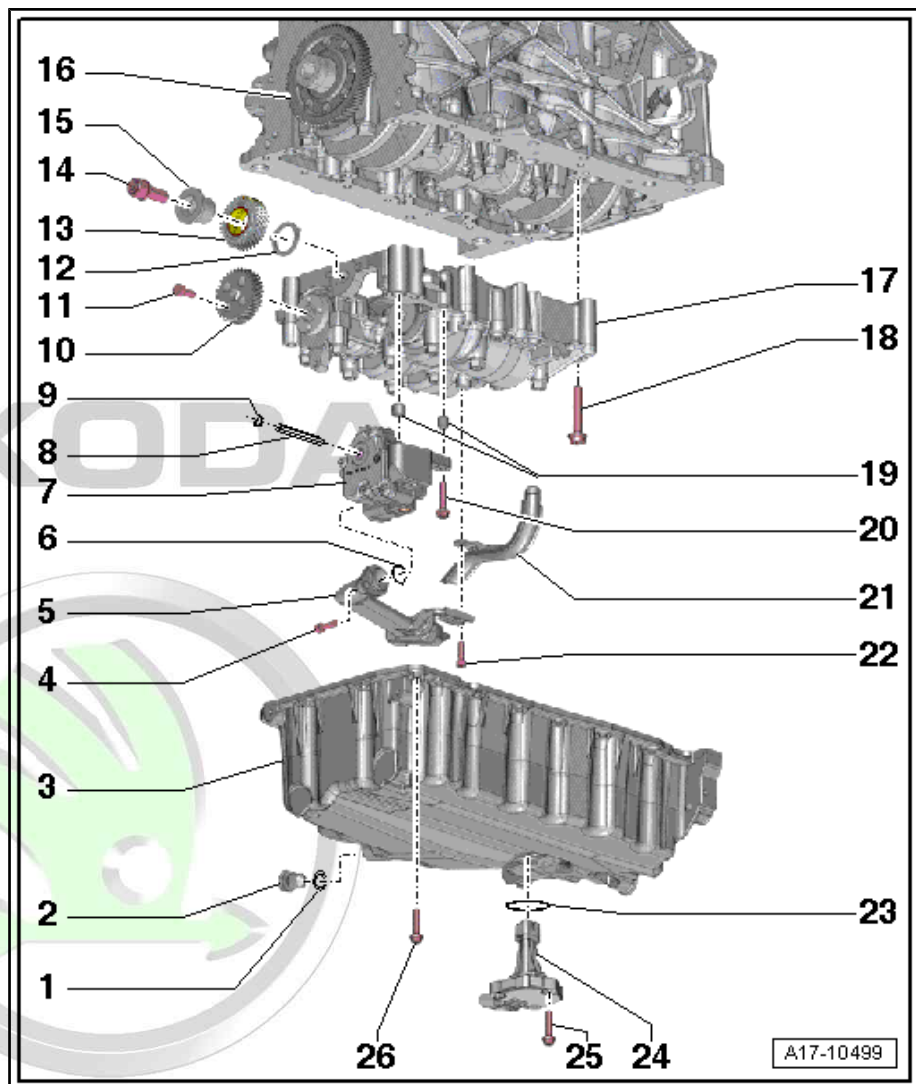
- ☐ Clean strainer if dirty

### 6 - O-ring

- ☐ Replace after removal

### 7 - Oil pump

- ☐ Removing and installing  
⇒ ["1.7 Removing and installing oil pump Superb II"](#), [page 147](#)
- ☐ before installing, check whether both assembly sleeves for centering the oil pump at the balancing shaft module are present



## 8 - Output shaft

- ☐ for oil pump

## 9 - Circlip

- ☐ must be positioned in the base of the groove
- ☐ replace damaged or over-extended circlip

## 10 - Pinion

- ☐ for balancing shaft

## 11 - Screw

- ☐ Replace after removal
- ☐ 20 Nm + 90°

## 12 - Axial bearing disc

- ☐ for intermediate wheel
- ☐ Replace after removal
- ☐ Fitting position ⇒ [page 140](#)

## 13 - Intermediate wheel

- ☐ for drive of balancing shaft
- ☐ Replace after removal
- ☐ Fitting position: part number must be visible.
- ☐ Observe the fitting position of the axial ring Pos. -12-



### Note

- ◆ *New intermediate wheel is equipped with special coating on the toothed flanks at a thickness such that the transmission ratio after its removal when the engine is running has the correct gear wheel clearance of 0.038-0.072 mm.*
- ◆ *The new intermediate wheel with undamaged coating is mounted without tooth flank clearance.*
- ◆ *While carrying out repairs, the intermediate wheel must always be used if the conditions for setting the tooth flank clearance in the drive of the balancing shafts change:*

- When slackening the fixing screw Pos. -14- of the intermediate wheel.
- When replacing the balancing shaft module Pos. -17-.
- When replacing the drive gear wheel on the crankshaft Pos. -16-, or when replacing the crankshaft.

## 14 - Screw

- ☐ Replace after removal
- ☐ 90 Nm + 90°

## 15 - Hub

- ☐ for intermediate wheel
- ☐ Replace after removal

## 16 - Drive pinion

- ☐ at the crankshaft
- ☐ for drive of balancing shaft module and the oil pump



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- ☐ Replace ⇒ [“3.6 Replacing the crankshaft drive pinion Superb II”, page 85](#)

## 17 - Balancing shaft module

- ☐ Removing ⇒ [“1.8 Removing and installing balancing shaft module Superb II”, page 148](#)
- ☐ before installing, check whether both assembly sleeves for centering the balancing shaft module at the cylinder block are present
- ☐ for locking the balancing shafts in the fitting position, use the rig tool - T10255-
- ☐ install new balancing shaft module ⇒ [“1.9 Installing new balancing shaft module Superb II”, page 149](#)
- ☐ Re-install used balancing shaft module that has already been used  
⇒ [“1.10 Re-installing the already used balancing shaft module Superb II”, page 151](#) .

## 18 - Screw

- ☐ Replace after removal
- ☐ Pay attention to order for tightening:
- ◆ install new balancing shaft module ⇒ [“1.9 Installing new balancing shaft module Superb II”, page 149](#)
- ◆ Re-install used balancing shaft module that has already been used  
⇒ [“1.10 Re-installing the already used balancing shaft module Superb II”, page 151](#) .

M7 = 13 Nm + 90°

M8 = 20 Nm + 90°

## 19 - Fitting sleeve

## 20 - Screw

- ☐ 10 Nm

## 21 - Intake manifold

## 22 - Screw

- ☐ 10 Nm

## 23 - Sealing ring

- ☐ Replace after removal

## 24 - Oil level and oil temperature sender - G266-

- ☐ Removing and installing  
⇒ [“1.3 Removing and installing oil level and oil temperature sender G266”, page 141](#)

## 25 - Screw

- ☐ 10 Nm

## 26 - Screw

- ☐ Pay attention to the procedure for tightening ⇒ [“1.5 Removing and installing oil pan”, page 143](#)
- ☐ 15 Nm

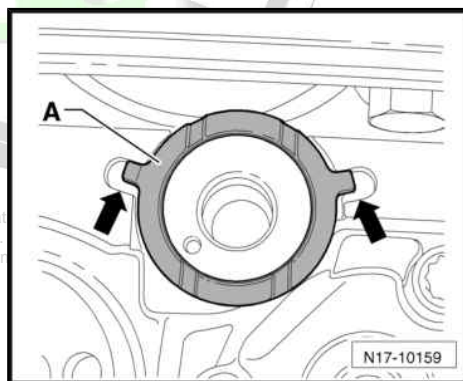
## Fitting position of the axial ring



### Caution

*Risk of the axial ring for the intermediate wheel slipping out and jamming behind the intermediate wheel.*

- ◆ *Fix the axial ring -A- on the balancing shaft module with grease in the fitting position. When installing the intermediate wheel, make sure that the axial ring does not slide off through the cut-out of the module for balancing shafts -arrows- and does not jam.*



## 1.3 Removing and installing oil level and oil temperature sender - G266-

### Removing

- Drain engine oil:
- ◆ ⇒ Maintenance ; Booklet Octavia II .
- ◆ ⇒ Maintenance ; Booklet Superb II .
- ◆ ⇒ Maintenance ; Booklet Yeti .
- Separate electrical plug connection -3-.
- Release screws -1- and remove oil level and oil temperature sender - G266- -4-.

### Installing

Assembly is carried out in the reverse order. When installing, observe the following:



#### Note

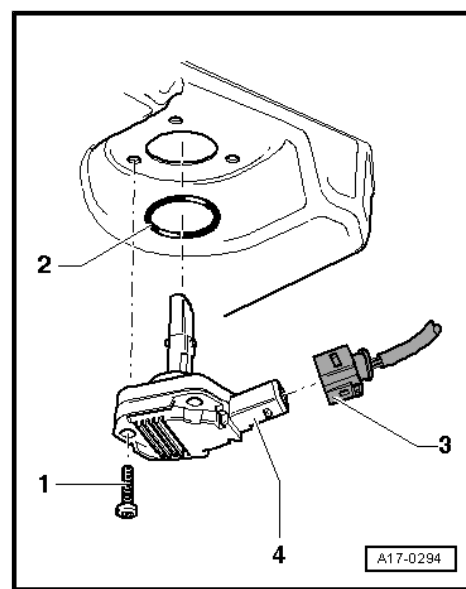
Replace gasket ring -2- and screws -1-.

- Top up with engine oil and check the oil level:

- ◆ ⇒ Maintenance ; Booklet Octavia II .
- ◆ ⇒ Maintenance ; Booklet Superb II .
- ◆ ⇒ Maintenance ; Booklet Yeti .

### Tightening torques

- ◆ Screw for oil level and oil temperature sender - G266- Octavia II, Yeti  
⇒ ["1.1 Summary of components - Parts of the lubrication system Octavia II, Yeti", page 135](#)
- ◆ Screw for oil level and oil temperature sender - G266- Superb II  
⇒ ["1.2 Summary of components - Parts of the lubrication system Superb II", page 138](#)



## 1.4 Summary of components - oil filter holder



#### 1 - Screw plug

- ☐ slacken and tighten with oil filter wrench - 3417-
- ☐ 25 Nm

#### 2 - Seal

- ☐ Replace after removal

#### 3 - Engine oil cooler

- ☐ After replacing, fill with fresh coolant  
⇒ ["1.3 Draining and filling coolant", page 163](#)
- ☐ Connection diagram for coolant hoses:

- ◆ Vehicles up to 08.2009  
⇒ ["1.1 Connection diagram for coolant hoses for vehicles up to 08.2009", page 160](#)

- ◆ Vehicles as of 08.2009  
⇒ ["1.2 Connection diagram for coolant hoses for vehicles from 08.2009", page 162](#)

- ☐ Removing and installing  
⇒ ["1.12 Removing and installing the oil filter holder with the engine oil cooler", page 153](#)

#### 4 - Seal

- ☐ Replace after removal
- ☐ Fitting position  
⇒ [page 143](#)

#### 5 - Screw

- ☐ Replace after removal
- ☐ tighten crosswise
- ☐ 15 Nm + 90°

#### 6 - Oil filter holder

- ☐ with return-flow check tube
- ☐ Oil return-flow check tube cannot be replaced individually
- ☐ Removing and installing  
⇒ ["1.12 Removing and installing the oil filter holder with the engine oil cooler", page 153](#)

#### 7 - Sealing ring

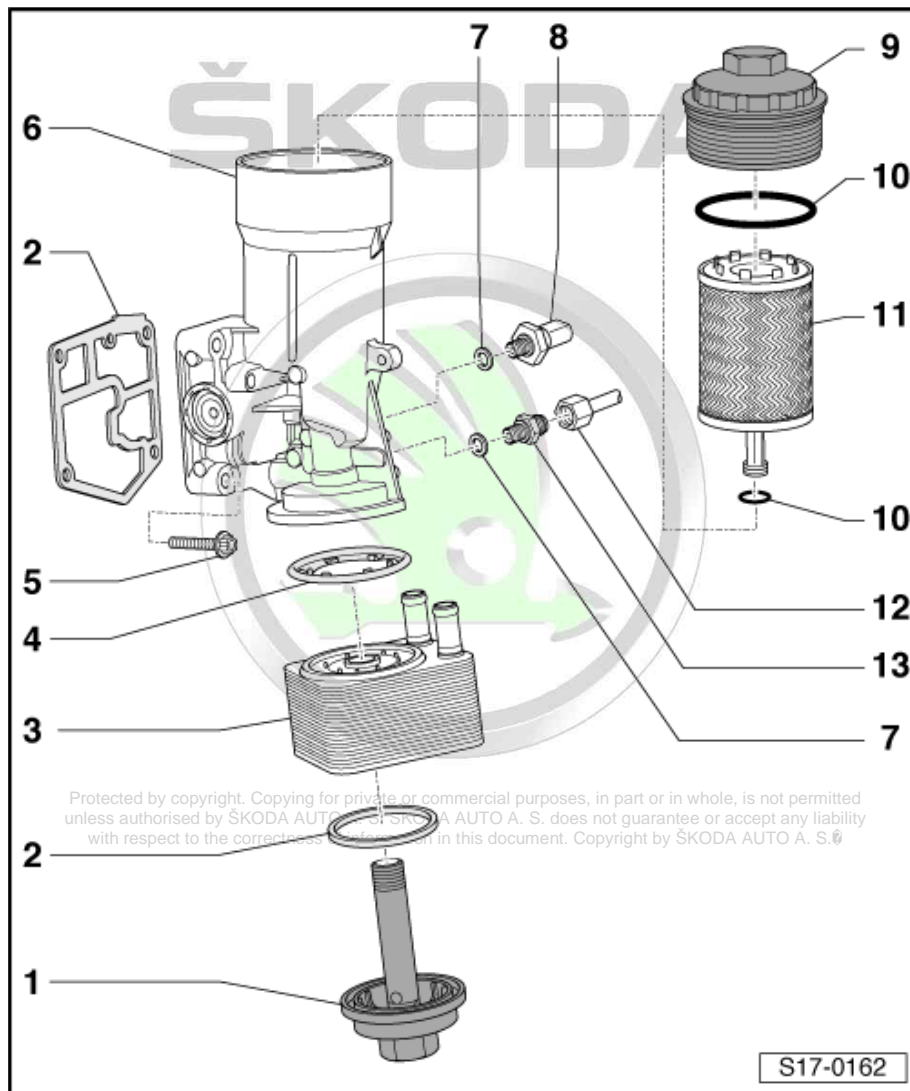
- ☐ Replace after removal

#### 8 - Oil pressure switch - F1-

- ☐ Marking: brown
- ☐ 0.07 MPa (0.7 bar) switch
- ☐ Removing and installing ⇒ ["1.11 Removing and installing oil pressure switch F1 ", page 153](#)
- ☐ Check ⇒ ["1.13 Testing oil pressure and oil pressure switch", page 157](#)
- ☐ 22 Nm

#### 9 - Screw cap

- ☐ slacken and tighten with oil filter wrench - 3417-
- ☐ 25 Nm



## 10 - O-ring

- ☐ Replace after removal

## 11 - Oil filter element

- ☐ pull off from cap -Pos. 9-
- ☐ If oil filter insert is changed, replace O-rings Pos. -10-
- ☐ Check fitting position
- ☐ Pay attention to change intervals:

◆ ⇒ Maintenance ; Booklet Octavia II .

◆ ⇒ Maintenance ; Booklet Superb II .

◆ ⇒ Maintenance ; Booklet Yeti .

## 12 - Oil feed line

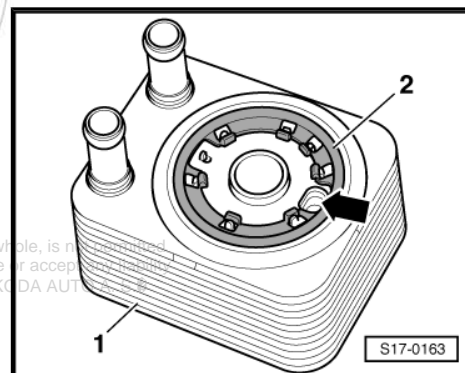
- ☐ to exhaust gas turbocharger
- ☐ Observe the mounting sequence:
  1. Screw in both union nuts by hand
  2. Tighten both union nuts to 22 Nm
  3. Secure the oil feed line in the brackets

## 13 - Connection fitting

- ☐ 30 Nm

### Fitting position of gasket for engine oil cooler

- Place the gasket -2- in such a way that it can be pressed onto all the lugs of the engine oil cooler -1-.
- The oil duct -arrow- must not be covered from the gasket.



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## 1.5 Removing and installing oil pan

### Special tools and workshop equipment required

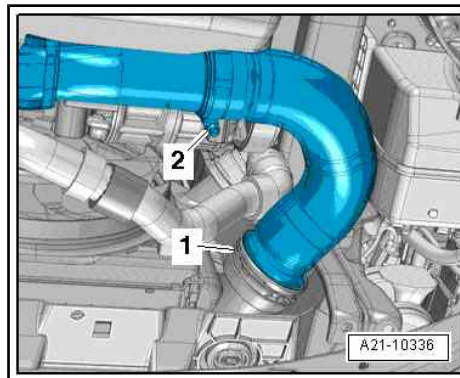
- ◆ Socket - T10058-
- ◆ Old oil collecting and suction equipment , e.g. -V.A.G 1782-
- ◆ Silicone sealant ⇒ ETKA - Electronic catalogue of original parts
- ◆ Sealant remover Gasket Stripper (stock code GST, stock item No. R 34402), manufacturer Retech s.r.o.
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves

### Removing

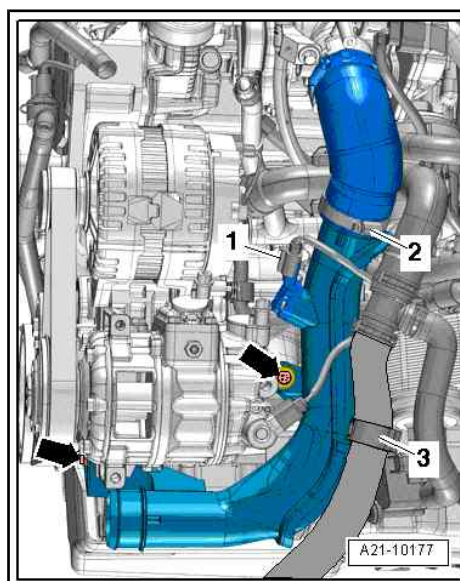
- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .
- Remove the right wheelhouse liner bottom part ⇒ Body Work; Rep. gr. 66 .



- Remove the right charge air hose, to do so loosen the hose clamp -2- and raise the clamp -1-.

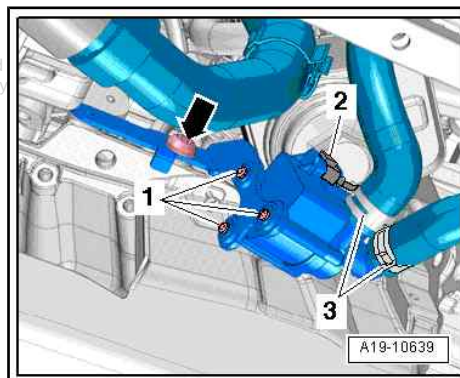


- Unscrew screws -arrows-, push the right charge air pipe slightly to the side and secure.

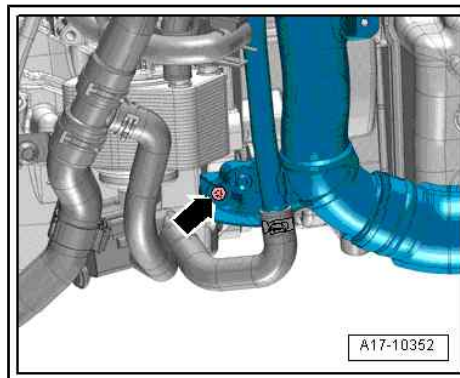


- Unscrew screw -arrow- and push the coolant recirculation pump 2 - V178- to the side.

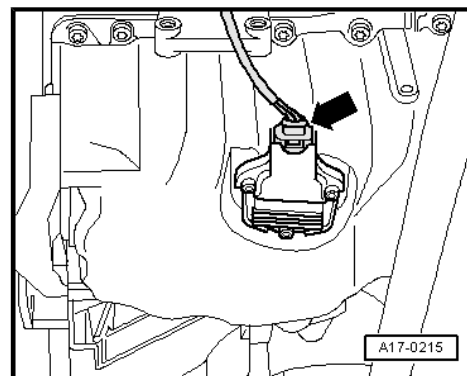
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- Unscrew screw -arrow- on the left charge air pipe.



- Disconnect plug at oil level and oil temperature sender - G266- .
- Suction off engine oil -V.A.G 1782- with old oil collecting and suction equipment:
- ◆ ⇒ Maintenance ; Booklet Octavia II .
- ◆ ⇒ Maintenance ; Booklet Superb II .
- ◆ ⇒ Maintenance ; Booklet Yeti .



- Unscrew the bolts of oil pan/gearbox -arrows-.
- Loosen bolts -1...20- crosswise and release.
- Remove oil pan, if necessary release by applying slight blows with a rubber-headed hammer.

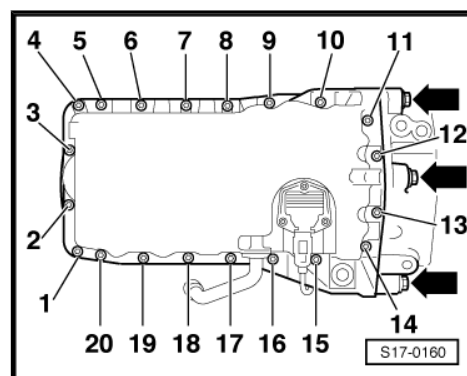
### Installing

Installation is carried out in the reverse order. When installing, observe the following:



### WARNING

***Wear protective gloves when working with sealant and grease remover!***

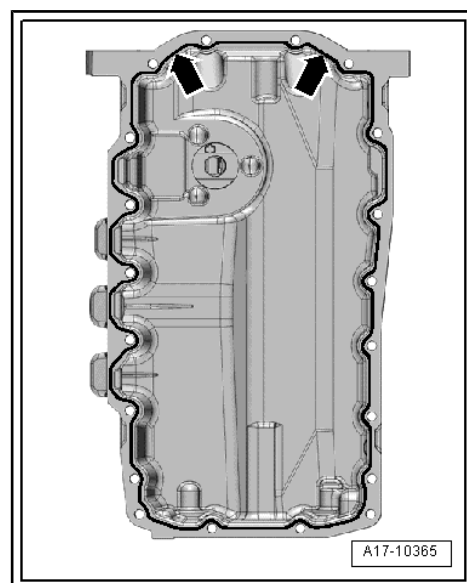


- Remove residual sealant from the sealing surfaces on the cylinder block and on the oil pan with chemical sealant remover.
- Degrease the sealing surfaces.
- Cut off nozzle tube at the front marking ( $\varnothing$  of nozzle approx. 3 mm).
- Apply silicone sealant bead -arrows- ⇒ ETKA - Electronic Catalogue of Original Parts to the clean sealing surface of the oil pan, as shown.
- Thickness of sealant bead: 2...3 mm



### Note

- ◆ *The sealant bead must not be thicker than 3 mm otherwise excess sealant may get into the oil pan and clog the strainer in the oil suction pipe.*
- ◆ *Take particular care when applying the sealant bead in the area of the sealing flange - gear box side - -arrows-.*
- ◆ *The oil pan must be installed within 5 minutes after applying the silicone sealant .*







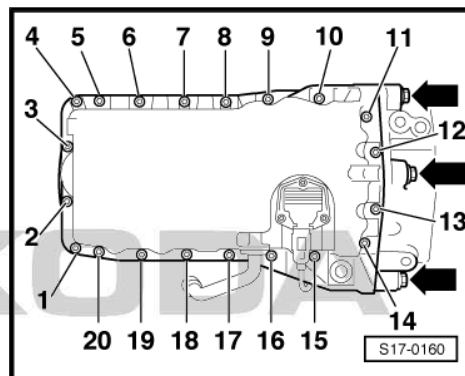
– Fit on oil pan immediately and tighten the bolts as follows:

1. Tighten screws -1...20- crosswise to 5 Nm.
2. Tighten the connecting screws of the oil pan/gearbox -arrows- to 40 Nm.



#### Note

*When installing the oil pan on a removed engine, this work step is not carried out. Make sure however that the pan is flush with the cylinder block on the flywheel side.*



3. Tighten screws -1...20- crosswise to 15 Nm.



#### Note

*Let sealing compound dry for approx. 30 minutes after installing oil sump. Only then fill with engine oil.*

– Fill with engine oil and check the oil level:

- ◆ ⇒ Maintenance ; Booklet Octavia II .
- ◆ ⇒ Maintenance ; Booklet Superb II .
- ◆ ⇒ Maintenance ; Booklet Yeti .

#### Tightening torques

- ◆ Charge air pipes Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#) .
- ◆ Charge air pipes Superb II  
⇒ [“2.2 Summary of components - Charge air cooler Superb II”, page 256](#) .
- ◆ Charge air pipes Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”, page 257](#) .
- ◆ Screws of the bracket for coolant recirculation pump 2 - V178-  
⇒ [“3.1 Summary of components - Parts of cooling system engine side”, page 174](#)

## 1.6 Removing and installing oil pump Octavia II, Yeti

### Removing

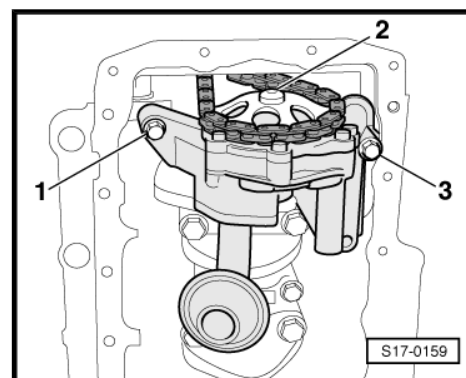
- Removing the oil pan  
⇒ [“1.5 Removing and installing oil pan”, page 143](#) .
- Remove baffle  
⇒ [“1.1 Summary of components - Parts of the lubrication system Octavia II, Yeti”, page 135](#) .

- Unscrew bolt -2-.
- Pull the chain sprocket off the oil pump shaft.
- Release screws -1- and -3- and remove oil pump.

### Installing

Assembly is carried out in the reverse order. When installing, observe the following:

- If no dowel sleeves for centering the oil pump are present on the oil pump housing, insert the dowel sleeves.
- Check oil pump chain for wear.
- Fitting position of chain sprocket on oil pump shaft: the chain sprocket can only be fitted on the shaft in one position
- Install oil sump  
⇒ [“1.5 Removing and installing oil pan”, page 143](#).



### Tightening torques

- ◆ Summary of components - parts of the lubrication system Octavia II, Yeti  
⇒ [“1.1 Summary of components - Parts of the lubrication system Octavia II, Yeti”, page 135](#)

## 1.7 Removing and installing oil pump Superb II

### Special tools and workshop equipment required

- ◆ Circlip pliers
- ◆ Magnet

### Removing

- Removing the oil pan  
⇒ [“1.5 Removing and installing oil pan”, page 143](#).
- Detach the intake manifold  
⇒ [“1.2 Summary of components - Parts of the lubrication system Superb II”, page 138](#) (Pos. -5-) from the oil pump.
- Remove circlip -1- with circlip pliers.
- Pull the input shaft -2- with magnet -arrow- out of the oil pump.
- Unscrew screws -3-, -4- and -5- and remove oil pump.



### Caution

*The screw at intermediate wheel must not be released.*

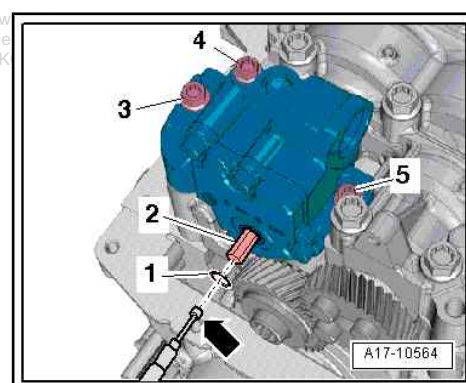
### Installing

Installation is carried out in the reverse order. When installing, observe the following:



### Note

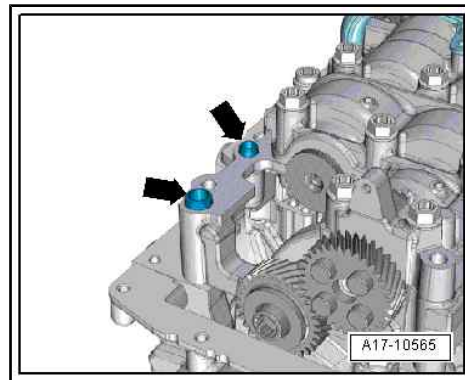
- ◆ Renew O-ring.
- ◆ Replace damaged or over-extended circlip.
- ◆ The circlip must be positioned in the base of the groove.



- Before installing the oil pump, check whether both assembly sleeves -arrows- are inserted, if necessary insert the sleeves.
- Install oil sump  
⇒ [“1.5 Removing and installing oil pan”, page 143](#) .

#### Tightening torques

- ♦ Oil pump to balancing shaft module  
⇒ [“1.2 Summary of components - Parts of the lubrication system Superb II”, page 138](#)
- ♦ Intake manifold to oil pump and balancing shaft module  
⇒ [“1.2 Summary of components - Parts of the lubrication system Superb II”, page 138](#)



## 1.8 Removing and installing balancing shaft module Superb II

### Special tools and workshop equipment required

- ♦ camshaft clamp - T10050-

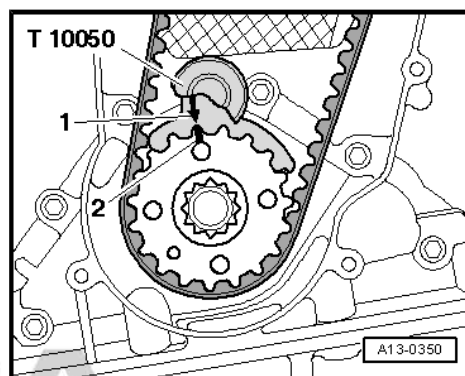
### Work procedure

- Removing the oil pan  
⇒ [“1.5 Removing and installing oil pan”, page 143](#) .
- Rotate the crankshaft on TDC in direction of rotation of the engine, interlock the crankshaft - toothed belt sprocket with the crankshaft arrester - T10050- . To do so, insert crankshaft arrester from the front side of the toothed belt sprocket into the teeth. The tooth segment of the camshaft sprocket must be at the »12 o'clock« position. If this is not the case, turn the crankshaft 360°.



#### Note

*The markings on the crankshaft - toothed belt sprocket -2- and on the crankshaft arrester - T10050- -1- must be aligned. While doing so, the stud of the crankshaft arrester - T10050- must engage in the hole of the sealing flange.*

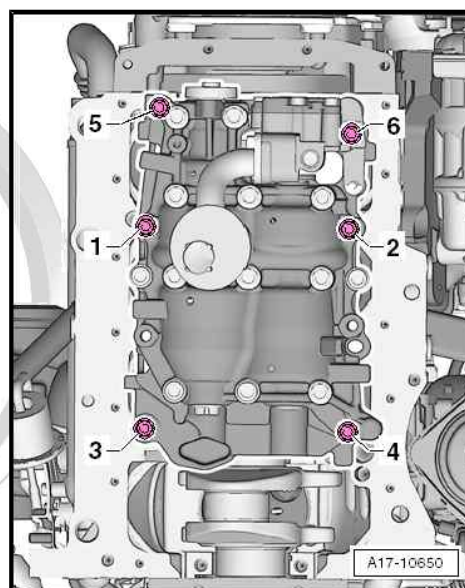


- Release screws in the sequence -6 ... 1- and remove balancing shaft module with oil pump.



#### Note

- ♦ Install new balancing shaft module  
⇒ [“1.9 Installing new balancing shaft module Superb II”, page 149](#) .
- ♦ Re-install the already used balancing shaft module  
⇒ [“1.10 Re-installing the already used balancing shaft module Superb II”, page 151](#) .



## 1.9 Installing new balancing shaft module Superb II

### Special tools and workshop equipment required

- ◆ Rig tool - T10255-
- ◆ camshaft clamp - T10050-

### Work procedure



#### Note

- ◆ *After a brief ramp-up time, the gear wheels for the balancing shaft module drive and oil pump must have an operating gear clearance of 0.038 ... 0.072 mm.*
- ◆ *In order to reach the desired tooth flank clearance, the coating on the tooth flanks of the new intermediate wheel must have a special thickness, so that after their quick removal, the gearbox has a correct tooth clearance when the engine is running for a short period of time.*
- ◆ *Always mount the new balancing shaft module with a new intermediate wheel with undamaged coating and set a zero tooth flank clearance while installing.*
- ◆ *Replace screws which have been tightened firmly to a torque angle.*

### Condition

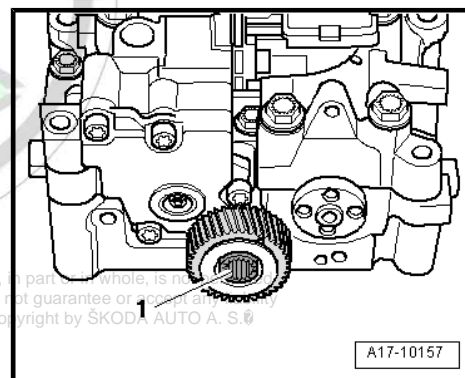
- The crankshaft is interlocked with the crankshaft arrester - T10050- at TDC for cylinder 1.



#### Note

*Ensure that the coating of the intermediate wheel is not damaged.*

- Before positioning the balancing shaft module at the cylinder block, slacken the screw -1- for intermediate wheel approx.  $\frac{1}{4}$  turn.
- Check the presence of both assembly sleeves for the correct position of the balancing shaft module on the cylinder block.
- Position the balancing shaft module on the cylinder block.



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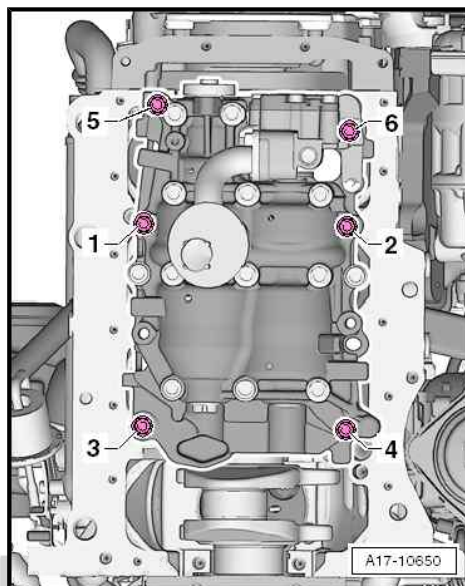




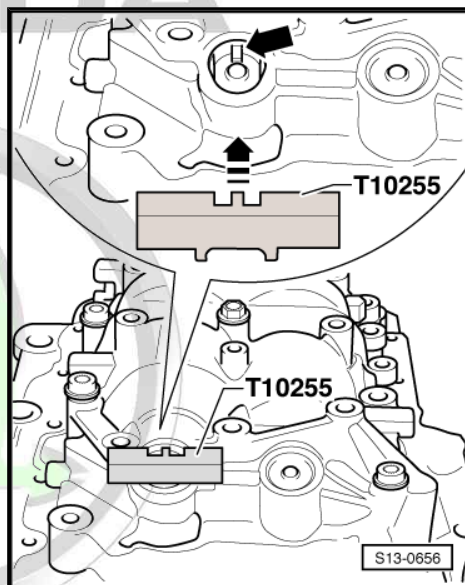
- Insert the fixing screws and start by tightening hand tight in the sequence -1 ... 6-.

Tighten screws of balancing shaft module as follows:

1. Pre-tighten the screws in the sequence -1 ... 6- to 6 Nm.
2. Tighten screws -1 ... 4- to 20 Nm.
3. Tighten screws -5- and -6- to 13 Nm.
4. Torque screws in the sequence -1 ... 6- a further 90° using a rigid wrench.



- Secure balancing shaft with extractor tool - T10255- in the fitting position, turn the balancing shaft a little where necessary.
- The stud of the rig tool must grip into the groove of the balancing shaft.

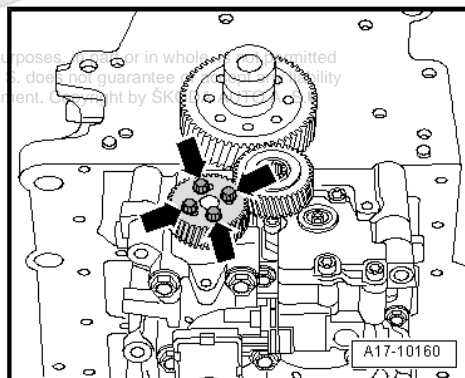


- Carefully put balancing shaft pinion onto the balancing shaft, to do so push the intermediate wheel slightly to the side.



**Note**

- ◆ Ensure that the coating of the new intermediate wheel is not damaged.
- ◆ If the oblong holes in the balancing shaft pinion are not aligned with the threaded bores, the balancing shaft pinion must be turned further by a corresponding number of teeth and put on again.



- Tighten balancing shaft pinion -arrows-.
- Remove rig tool - T10255- .

The following 3 work steps must be carried out simultaneously (2nd mechanic is required).

- If necessary forcefully push the intermediate wheel -3- with the aid of a wooden rod in -direction of arrow- into the serration of the drive pinion -2- and balancing shaft pinion -1-.
- While doing so slightly turn the balancing shaft pinion anti-clockwise.
- Tighten screw for intermediate wheel.
- Remove crankshaft arrester - T10050- .



#### Note

*After installing, the intermediate wheel must not have any noticeable torsional clearance. This can be checked by hand with little force.*

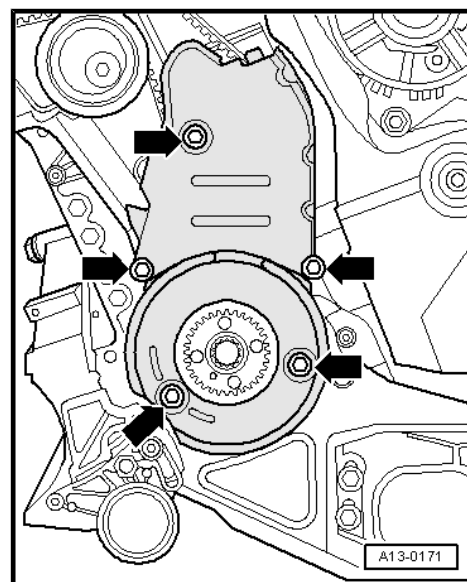
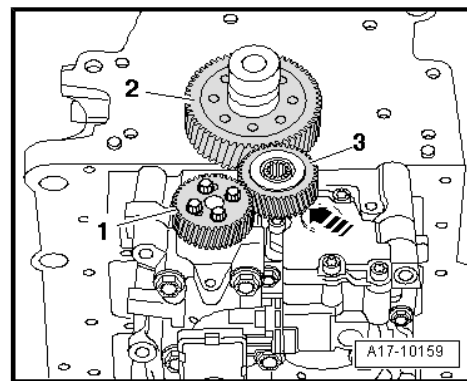
- Screw on the bottom timing belt guard -arrows-.

Installation is carried out in the reverse order. When installing, note the following:

- Install oil sump  
⇒ [“1.5 Removing and installing oil pan”, page 143](#) .
- Install belt pulley with vibration damper  
⇒ [“1.6 Removing and installing vibration damper”, page 48](#) .

#### Tightening torques

Component		Tightening torque
Balancing shaft module to cylinder block	M 7	13 Nm + 90° <sup>1)</sup>
	M 8	20 Nm + 90° <sup>1)</sup>
Balancing shaft pinion to balancing shaft		20 Nm + 90° <sup>1)</sup>
Intermediate wheel to balancing shaft module		90 Nm + 90° <sup>1)</sup>
Timing belt guard to engine		10 Nm
Note: <sup>1)</sup> Replace bolts.		



## 1.10 Re-installing the already used balancing shaft module Superb II

### Special tools and workshop equipment required

- ◆ Rig tool - T10255-
- ◆ camshaft clamp - T10050-

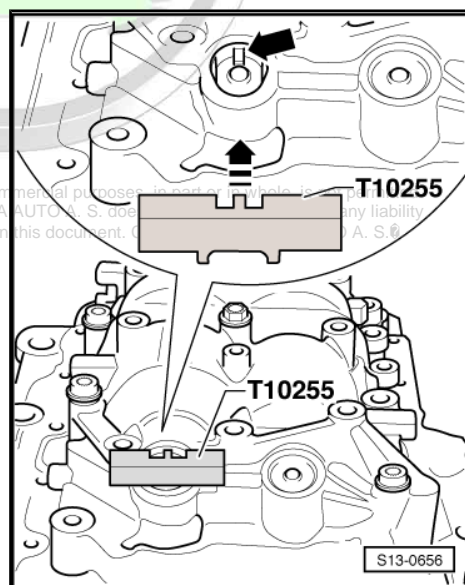


## Note

- ♦ If the previously used balancing shaft module is re-installed and neither the crankshaft nor the drive pinion on the crankshaft was replaced, proceed as described below. The screw for the intermediate wheel must on no account be released.
- ♦ After each time the screw for the intermediate wheel is undone, e.g. after replacing the crankshaft or the drivegear on the crankshaft, a new intermediate wheel will need to be installed. Procedure for installing  
⇒ "1.9 Installing new balancing shaft module Superb II", page 149.
- ♦ Screws which have been tightened firmly to a torquing angle must be replaced.

## Condition

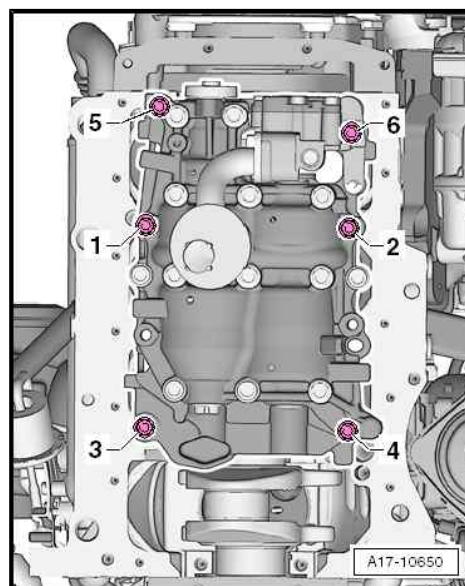
- The crankshaft is interlocked with the crankshaft arrester - T10050- at TDC for cylinder 1.
- Interlock balancing shaft with rig tool - T10255- , to do so turn the balancing shaft if necessary.
- The stud of the extractor - T10255- must grip into the groove of the balancing shaft.
- Check the presence of both assembly sleeves for the correct position of the balancing shaft module on the cylinder block.
- Position the balancing shaft module on the cylinder block.
- If the balancing shaft is interlocked, the intermediate wheel must grip into the drive pinion on the crankshaft.
- The intermediate wheel must have an easy to determine torsional clearance.



- Insert the fixing screws and start by tightening hand tight in the sequence -1 ... 6-.

Tighten screws of balancing shaft module as follows:

1. Pre-tighten the screws in the sequence -1 ... 6- to 6 Nm.
  2. Tighten screws -1 ... 4- to 20 Nm.
  3. Tighten screws -5- and -6- to 13 Nm.
  4. Torque screws in the sequence -1 ... 6- a further 90° using a rigid wrench.
- Remove rig tool - T10255- .
  - Remove crankshaft arrester - T10050- .



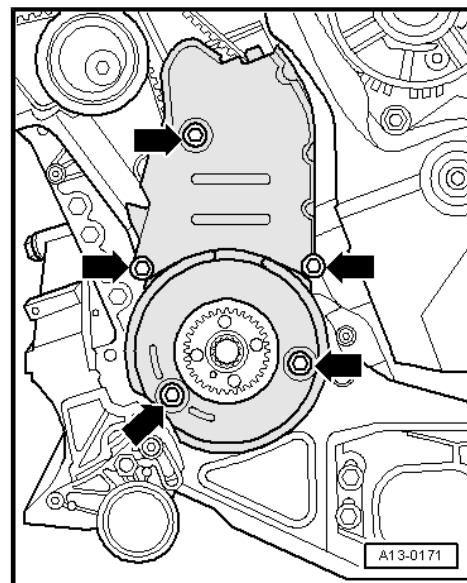
- Screw on the bottom timing belt guard -arrows-.

Installation is carried out in the reverse order. When installing, note the following:

- Install oil sump  
⇒ [“1.5 Removing and installing oil pan”, page 143](#) .
- Install belt pulley with vibration damper  
⇒ [“1.6 Removing and installing vibration damper”, page 48](#) .

#### Tightening torques

Component		Tightening torque
Balancing shaft module to cylinder block	M 7	13 Nm + 90° <sup>1)</sup>
	M 8	20 Nm + 90° <sup>1)</sup>
Timing belt guard to engine		10 Nm
Note: <sup>1)</sup> Replace bolts.		



## 1.11 Removing and installing oil pressure switch - F1-

#### Special tools and workshop equipment required

- ◆ Assembly tool - T10118-

#### Removing

- Remove air filter housing  
⇒ [“3.5 Removing and installing air filter housing”, page 307](#) .
- Disconnect plug -1- at oil pressure switch - F1- with assembly device - T10118- .
- Screw out oil pressure switch - F1- -2-.

#### Installing

Installation is carried out in the reverse order. When installing, observe the following:

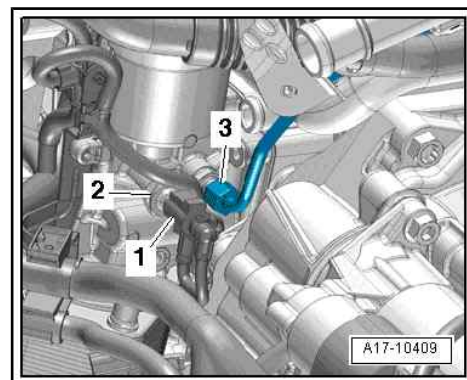


Note

Replace sealing ring.

#### Tightening torques

- ◆ Oil pressure switch - F1-  
⇒ [“1.4 Summary of components - oil filter holder”, page 141](#) .



## 1.12 Removing and installing the oil filter holder with the engine oil cooler

#### Special tools and workshop equipment required

- ◆ Assembly tool - T10118-
- ◆ Hose clamps - MP7-602 (3094)-
- ◆ Old oil collecting and suction equipment , e.g. -V.A.G 1782-
- ◆ Radiator protection mat - VAS 531003-

#### Removing

- Drain coolant ⇒ [“1.3 Draining and filling coolant”, page 163](#)

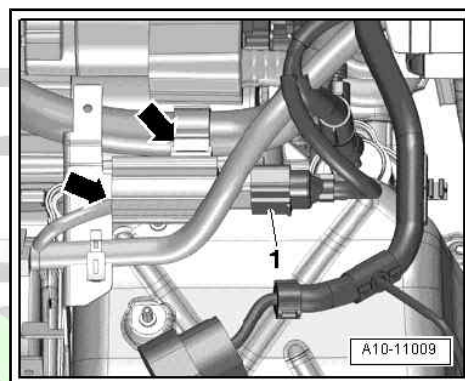




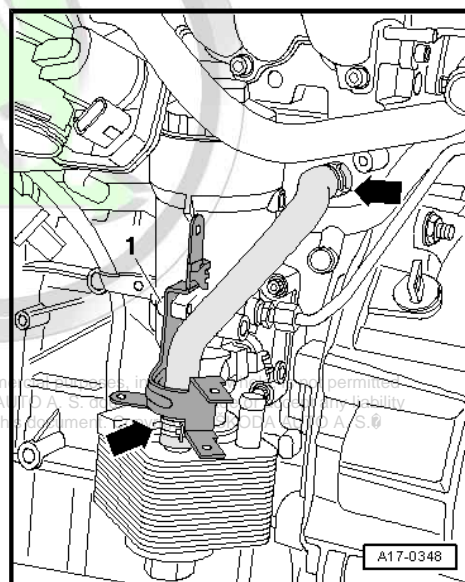
- Remove air filter housing  
⇒ [“3.5 Removing and installing air filter housing”, page 307](#) .
- Remove fan shroud with radiator fans  
⇒ [“4.2 Removing and installing fan shroud for radiator fan”, page 188](#) .
- Cover radiator with radiator protection mat - VAS 531003- .



- Slacken the wiring looms -arrows- and the plugs -1- on the bracket and the left charge air pipe.

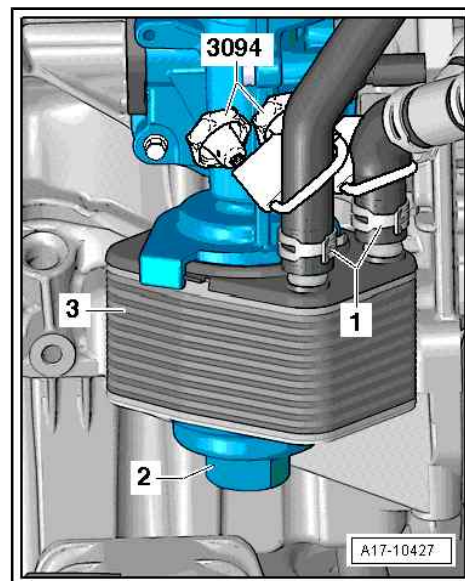


- Remove screw -1- and wiring loom bracket.

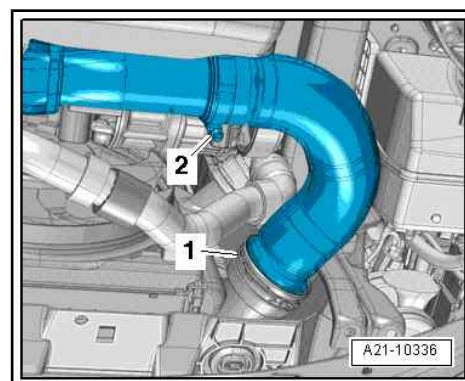


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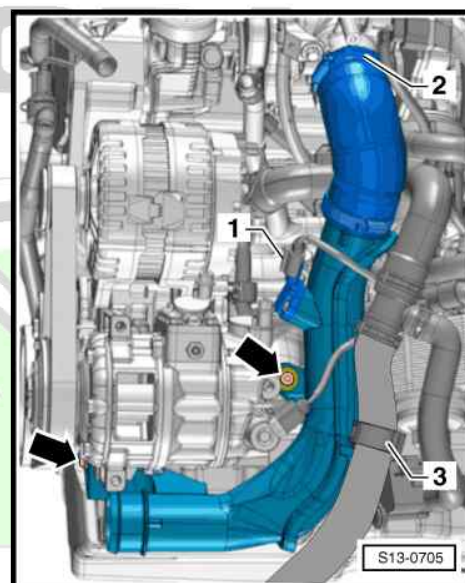
- Clamp off coolant hoses with hose clamps - MP7-602 (3094)- as shown in the illustration.
- Remove the coolant hoses from the engine oil cooler, to do so slacken the hose clamps -1-.



- Remove the right charge air hose, to do so loosen the hose clamp -2- and raise the clamp -1-.

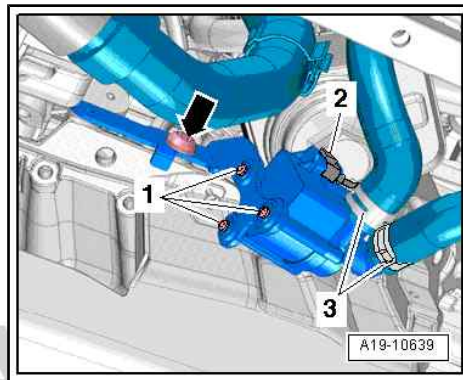


- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Loosen hose clamp -2-.
- Disconnect plug -1- at the charge pressure sender - G31- and remove the right charge air pipe.

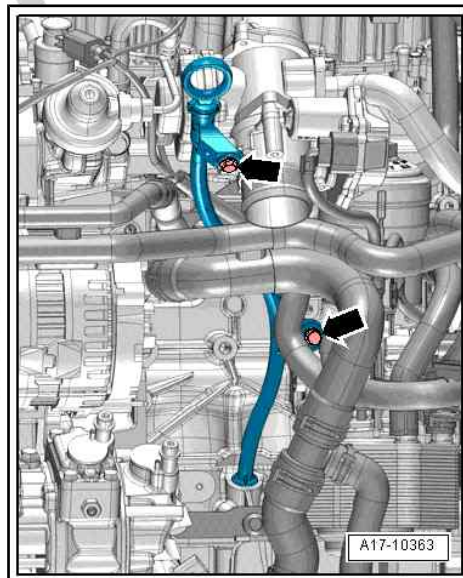
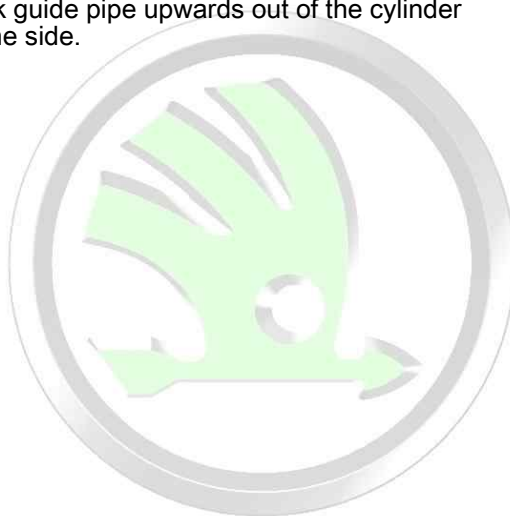




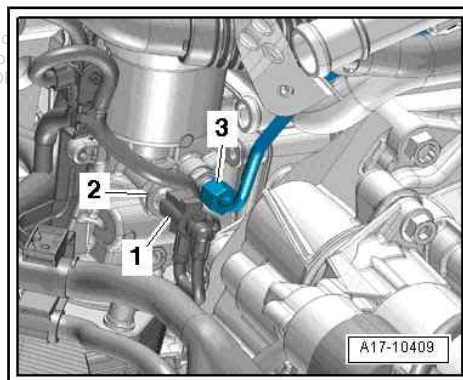
- Unscrew plug -arrow-.
- Push the coolant recirculation pump 2 - V178- to the side.



- Slightly pull out the oil dipstick and unscrew the screws -arrows-.
- Pull out the oil dipstick guide pipe upwards out of the cylinder block and push it to the side.



- Disconnect plug -1- at oil pressure switch - F1- with assembly device - T10118-.
- Screw out oil pressure switch -2-.
- Unscrew the oil feed line from the connection on the oil filter holder, to do so hold on the hexagon using an assembly spanner and slacken the union nut -3-.
- Place a used oil collector and extractor e.g. -V.A.G 1782- under the engine.



- Unscrew screws -arrows- and remove oil filter holder.

### Installing

Installation is carried out in the reverse order. When installing, observe the following:



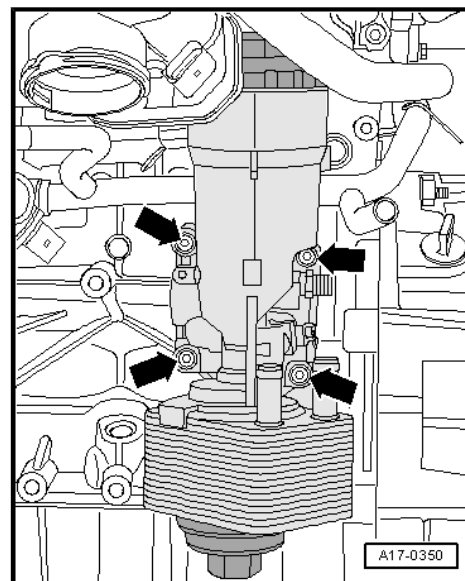
#### Note

- ◆ Replace gaskets, gasket rings and O-rings.
- ◆ Hose connections as well as charge air pipes and charge air hoses must be free of oil and grease before being installed.
- ◆ Observe the assembly instruction for hose connections with push-fit couplings ➔ ["2.6 Hose connections", page 261](#).

- Install the oil dipstick guide pipe ➔ [page 138](#).

- Checking the oil level:

- ◆ ➔ Maintenance ; Booklet Octavia II .
- ◆ ➔ Maintenance ; Booklet Superb II .
- ◆ ➔ Maintenance ; Booklet Yeti .



#### Caution

**Replace all the coolant when installing the new engine oil cooler ➔ ["1.3 Draining and filling coolant", page 163](#)**

- Replenish with engine oil and check the oil level  
➔ ["1.3 Draining and filling coolant", page 163](#).

### Tightening torques

- ◆ Screws for oil filter bracket  
➔ ["1.4 Summary of components - oil filter holder", page 141](#)
- ◆ Oil pressure switch - F1-  
➔ ["1.4 Summary of components - oil filter holder", page 141](#).
- ◆ Union nut of the oil feed line  
➔ ["1.4 Summary of components - oil filter holder", page 141](#)
- ◆ Charge air pipe Octavia II  
➔ ["2.1 Summary of components - Charge air cooler Octavia II", page 255](#).
- ◆ Charge air pipe Superb II  
➔ ["2.2 Summary of components - Charge air cooler Superb II", page 256](#).
- ◆ Charge air pipe Yeti  
➔ ["2.3 Summary of components - Charge air cooler Yeti", page 257](#).
- ◆ Screws of the bracket for coolant recirculation pump 2 - V178-  
➔ ["3.1 Summary of components - Parts of cooling system engine side", page 174](#)

## 1.13 Testing oil pressure and oil pressure switch

### Special tools and workshop equipment required

- ◆ Oil pressure tester , e.g. -V.A.G 1342-
- ◆ Voltage tester , e. g. -V.A.G 1527 B-





- ◆ Auxiliary measuring set, , e. g. -V.A.G 1594 C-

#### Test conditions

- The oil level is OK
- Coolant temperature approx. 80°C

#### Test preparations

- Remove oil pressure switch - F1-  
⇒ ["1.11 Removing and installing oil pressure switch F1", page 153](#) .

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- Screw the connection of the oil pressure tester - V.A.G 1342- into the hole for the oil pressure switch.
- Screw the oil pressure switch -2- into the oil pressure tester.

#### Testing oil pressure switch

- Connect brown cable -1- of oil pressure tester to earth (-).
- Unclamp the voltage tester with its auxiliary cables out of the measuring tool set on the oil pressure switch and plus (+) terminal on the battery.
- The LED must not light up.

If the LED lights up:

- Replace oil pressure switch.

If the LED does not light up:

- Start engine.



#### Note

*Observe the testing equipment and the LED while actuating the starter since the switching point of the oil pressure switch can already be exceeded when starting up.*

- The LED must come on at an overpressure of 0.055 ... 0.085 MPa (0.55 ... 0.85 bar).

If the LED does not light up:

- Replace oil pressure switch.

#### Testing oil pressure

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- Start engine.
- Oil pressure when engine idling: at least 0.08 MPa (0.8 bar).
- Oil pressure at 2000 rpm: min. 0.2 MPa (2.0 bar).

If the specified values are not reached: Oil pump defective.

- Replace oil pump:

#### ◆ Octavia II, Yeti

⇒ ["1.6 Removing and installing oil pump Octavia II, Yeti", page 146](#) .

#### ◆ Superb II

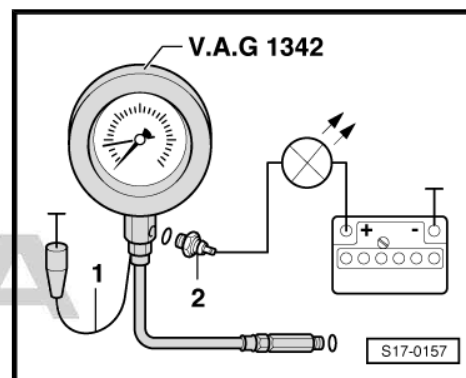
⇒ ["1.7 Removing and installing oil pump Superb II", page 147](#) .

- Oil pressure at a higher engine speed: max. 0.7 MPa (7.0 bar).

If the specified value is exceeded: Pressure relief valve defective.

- Replace oil filter holder

⇒ ["1.12 Removing and installing the oil filter holder with the engine oil cooler", page 153](#) .





## 19 – Cooling

### 1 Cooling system

⇒ [“1.1 Connection diagram for coolant hoses for vehicles up to 08.2009”, page 160](#)

⇒ [“1.2 Connection diagram for coolant hoses for vehicles from 08.2009”, page 162](#)

⇒ [“1.3 Draining and filling coolant”, page 163](#)



#### WARNING

*When opening the expansion reservoir, out hot steam or hot coolant may escape. Cover the cap with a cloth and open carefully.*



#### Note

- ◆ *When the engine is warm the cooling system is under pressure. If necessary, release pressure before beginning repair work.*
- ◆ *Secure all hose connections with corresponding hose clips.*
- ◆ *Spring-type clip pliers are recommended for installation of spring-type clips.*
- ◆ *Replace seals and sealing rings.*
- ◆ *The arrows affixed to the coolant pipes and the coolant hoses must stand opposite to each other.*
- ◆ *Replace all the coolant after replacing the components (see diagram) ⇒ [“1.3 Draining and filling coolant”, page 163](#)*

#### 1.1 Connection diagram for coolant hoses for vehicles up to 08.2009



## 1 - expansion reservoir

- ☐ with cap
- ☐ Check the overpressure valve in the screw cap  
⇒ [“4.4 Check cooling system for leaks”, page 191](#)

## 2 - Radiator for exhaust gas recirculation

- ☐ After replacing, fill with fresh coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#)
- ☐ Removing and installing  
⇒ [“2.3 Removing and installing radiator for exhaust gas recirculation”, page 332](#)

## 3 - to auxiliary heating

## 4 - from the auxiliary heating

## 5 - Cylinder block

- ☐ After replacing, fill with fresh coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#)

## 6 - Heat exchanger for heating

- ☐ After replacing, fill with fresh coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#)

## 7 - Throttle aperture

- ☐ integrated in the coolant hose, not visible from the outside
- ☐ The fitting position is not defined, therefore the coolant hose must not be unclipped with the hose clamp (Risk of damage!)

## 8 - Gearbox oil cooler

- ☐ only on vehicles with automatic gearbox
- ☐ After replacing, fill with fresh coolant ⇒ [“1.3 Draining and filling coolant”, page 163](#)

## 9 - Left coolant hose

## 10 - Engine oil cooler

- ☐ After replacing, fill with fresh coolant ⇒ [“1.3 Draining and filling coolant”, page 163](#)
- ☐ Removing and installing  
⇒ [“1.12 Removing and installing the oil filter holder with the engine oil cooler”, page 153](#)

## 11 - Coolant recirculation pump 2 - V178-

- ☐ Removing and installing ⇒ [“3.4 Remove and install coolant recirculation pump 2 V178”, page 177](#)

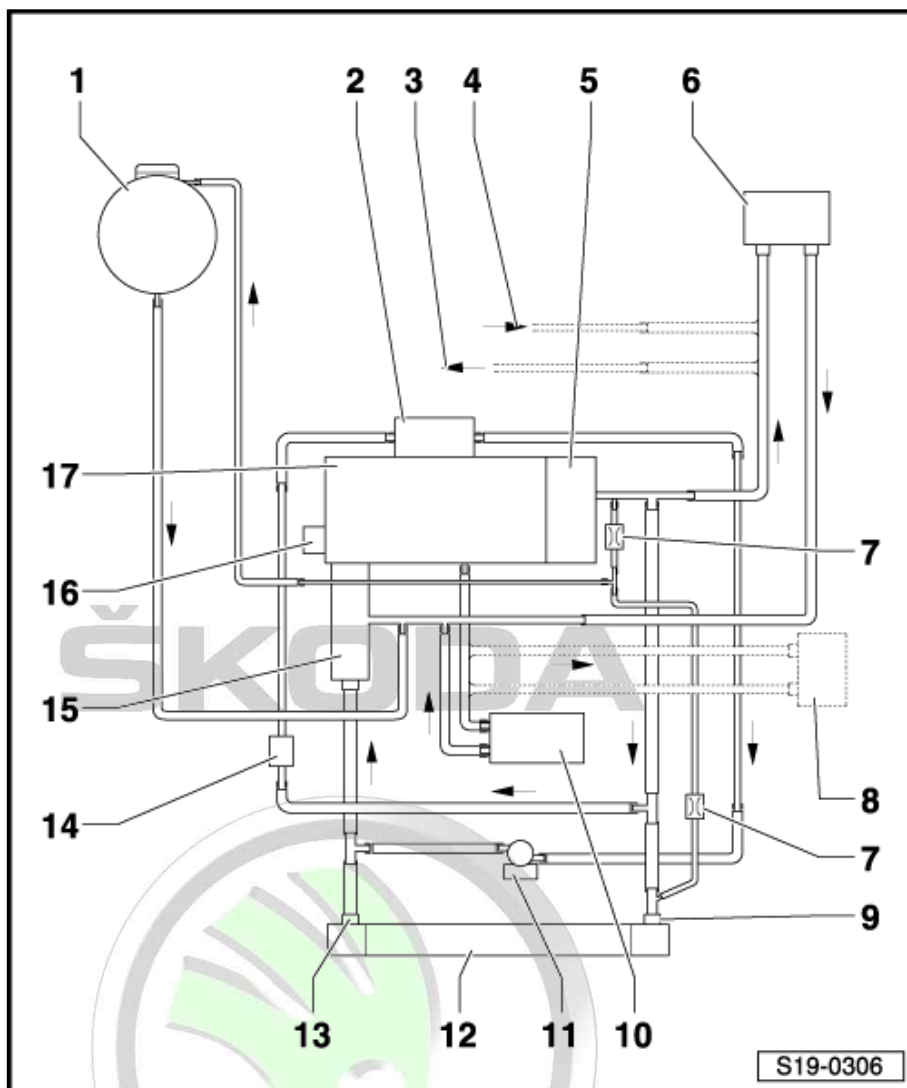
## 12 - Radiator

- ☐ Removing and installing ⇒ [“4.3 Removing and installing radiator”, page 189](#)
- ☐ After replacing, fill with fresh coolant ⇒ [“1.3 Draining and filling coolant”, page 163](#)

## 13 - Right coolant hose

## 14 - Coolant temperature sender at radiator outlet - G83-

- ☐ Replace ⇒ [“3.3 Replace coolant temperature sender at radiator outlet G83”, page 177](#)



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## 15 - Coolant regulator

- ❑ Removing and installing  
⇒ ["2.4 Removing and installing coolant regulator - \(vehicles up to 08.2009\)", page 168](#)

## 16 - Coolant pump

- ❑ Removing and installing ⇒ ["2.3 Removing and installing coolant pump", page 167](#)

## 17 - Cylinder head

- ❑ After replacing, fill with fresh coolant ⇒ ["1.3 Draining and filling coolant", page 163](#)

## 1.2 Connection diagram for coolant hoses for vehicles from 08.2009

### 1 - Radiator

- ❑ Removing and installing  
⇒ ["4.3 Removing and installing radiator", page 189](#)
- ❑ After replacing, fill with fresh coolant  
⇒ ["1.3 Draining and filling coolant", page 163](#)

### 2 - Coolant recirculation pump 2 - V178-

- ❑ Removing and installing  
⇒ ["3.4 Remove and install coolant recirculation pump 2 V178", page 177](#)

### 3 - Engine oil cooler

- ❑ After replacing, fill with fresh coolant  
⇒ ["1.3 Draining and filling coolant", page 163](#)
- ❑ Removing and installing  
⇒ ["1.12 Removing and installing the oil filter holder with the engine oil cooler", page 153](#)

### 4 - 4/2 way valve with coolant regulator

- ❑ Removing and installing  
⇒ ["2.5 Removing and installing 4/2 way valve with coolant regulator \(vehicles from 08.2009\)", page 171](#)

### 5 - Coolant pump

- ❑ Removing and installing  
⇒ ["2.3 Removing and installing coolant pump", page 167](#)

### 6 - Cylinder head and cylinder block

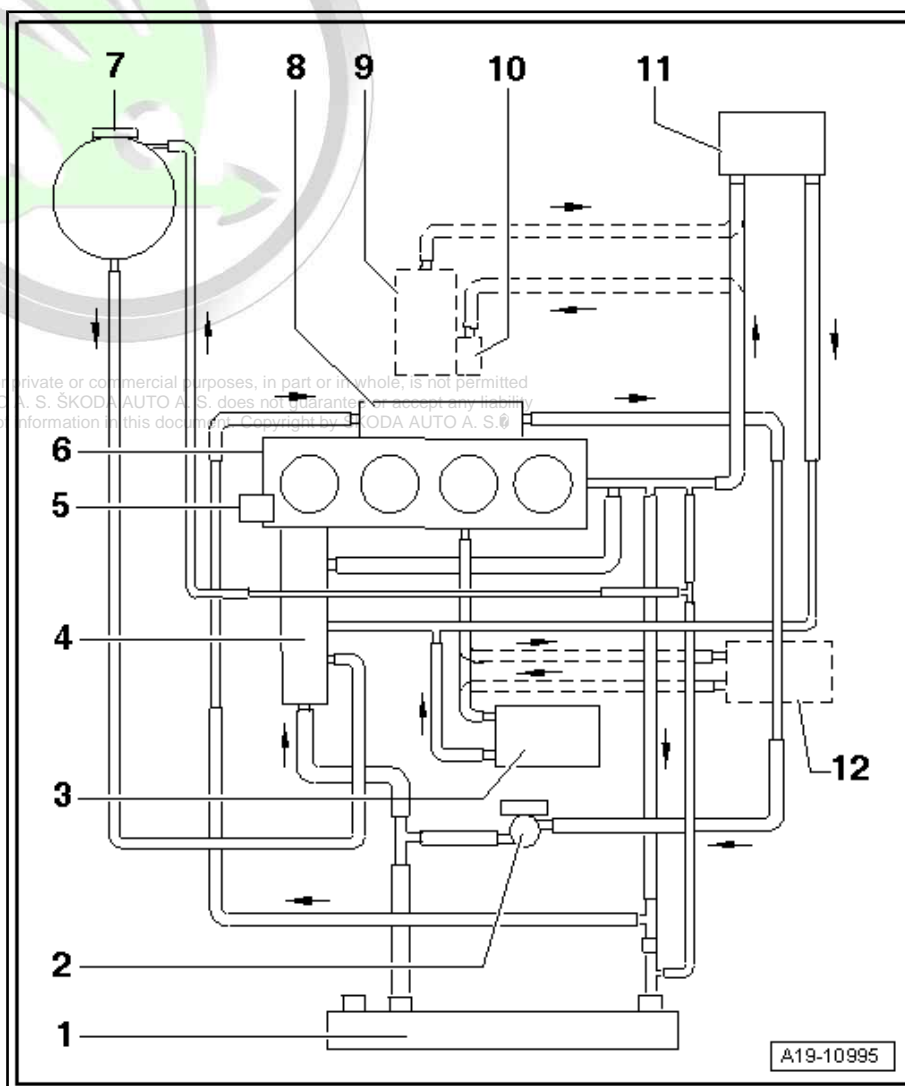
- ❑ After replacing, fill with fresh coolant ⇒ ["1.3 Draining and filling coolant", page 163](#)

### 7 - expansion reservoir

- ❑ with cap
- ❑ Check the overpressure valve in the screw cap ⇒ ["4.4 Check cooling system for leaks", page 191](#)

### 8 - Radiator for exhaust gas recirculation

- ❑ After replacing, fill with fresh coolant ⇒ ["1.3 Draining and filling coolant", page 163](#)



- ☐ Removing and installing  
⇒ [“2.3 Removing and installing radiator for exhaust gas recirculation”, page 332](#)

## 9 - Auxiliary heating

### 10 - Circulating pump - V55-

- ☐ only on vehicles with auxiliary heating

### 11 - Heat exchanger for heating

- ☐ After replacing, fill with fresh coolant ⇒ [“1.3 Draining and filling coolant”, page 163](#)

### 12 - Gearbox oil cooler

- ☐ only on vehicles with automatic gearbox
- ☐ After replacing, fill with fresh coolant ⇒ [“1.3 Draining and filling coolant”, page 163](#)

## 1.3 Draining and filling coolant

### Special tools and workshop equipment required

- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Pliers for spring-type clips
- ◆ Refractometer
- ◆ Protective goggles and gloves

### Draining



#### WARNING

*When opening the expansion reservoir, out hot steam or hot coolant may escape. Cover the cap with a cloth and open carefully.*

Open the cap of the coolant expansion reservoir.

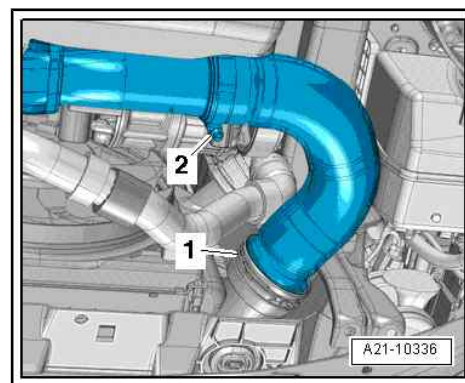
- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .
- Remove the right charge air hose, to do so loosen the hose clamp -2- and raise the clamp -1-.



#### WARNING

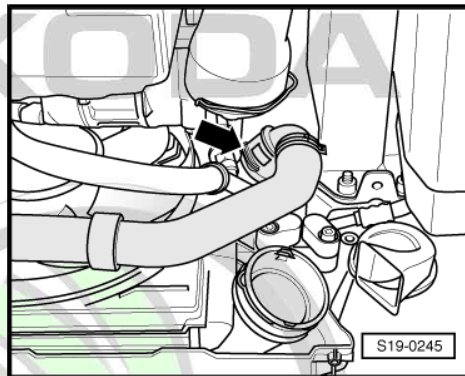
*Shut off the opening of the charge air cooler, e.g. with a clean foam piece, so that no coolant can penetrate.*

- Place a catch pan under the engine.

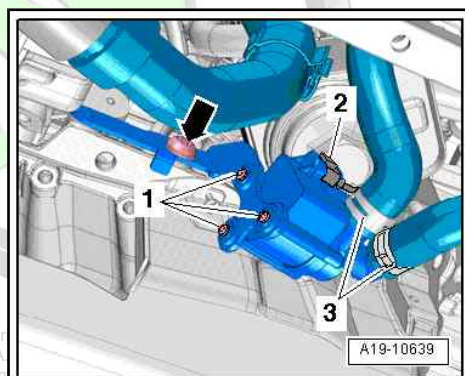




- Remove the right coolant hose from the radiator; to do so pull the retaining clip -arrow-.



- Remove the coolant hoses -3- at the coolant recirculation pump 2 - V178- .
- Remove air filter housing  
⇒ [“3.5 Removing and installing air filter housing”, page 307](#) .



- Detach the rear coolant hose on the engine oil cooler -arrow- and drain residual coolant.

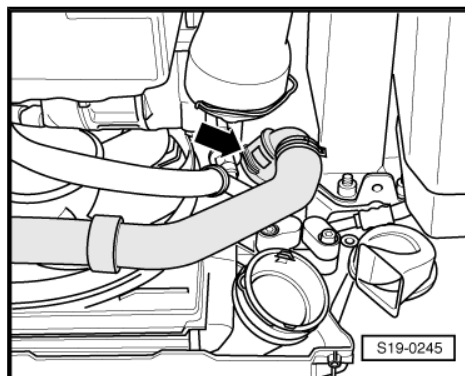
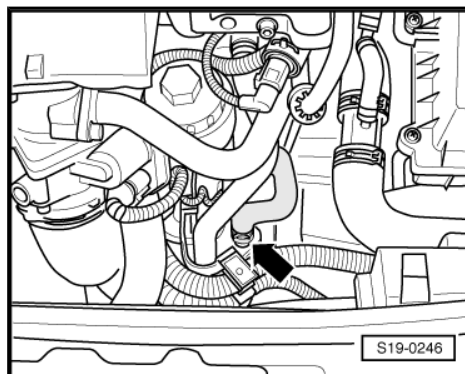
#### Filling up



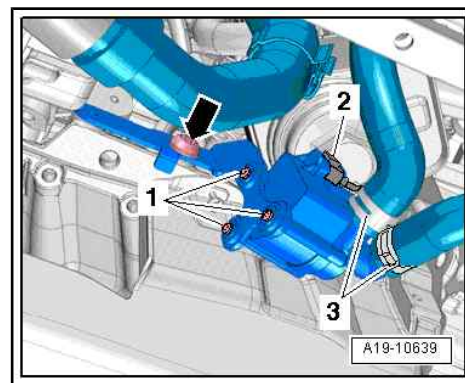
#### Note

- ◆ *The drained coolant must not be re-used.*
- ◆ *Observe the disposal instructions.*
- ◆ *Replace O-rings.*

- Connect right coolant hose at radiator -arrow-.



- Connect the coolant hoses -3- at the coolant recirculation pump 2 - V178- .

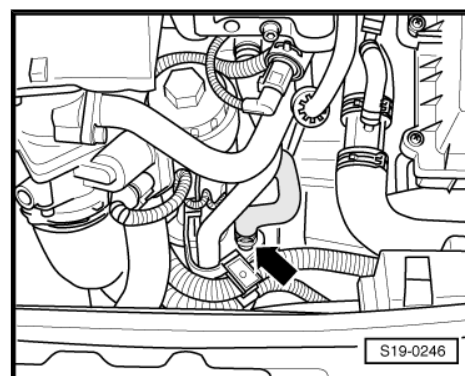


- Connect the coolant hose on the engine oil cooler at the rear -arrow-.

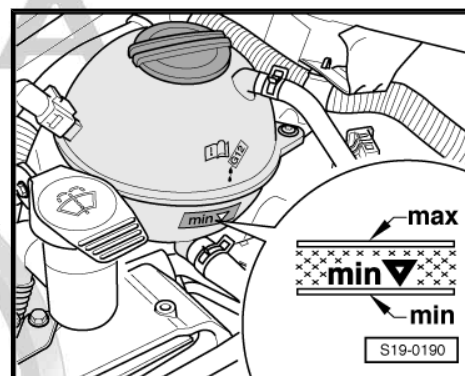
Select the appropriate coolant additive from the ⇒ ETKA - Electronic catalogue of original parts .

- In a clean reservoir, mix distilled water and coolant additive in the specified mixing ratio:

- ◆ ⇒ Maintenance ; Booklet Octavia II .
- ◆ ⇒ Maintenance ; Booklet Superb II .
- ◆ ⇒ Maintenance ; Booklet Yeti .



- Fill the cooling system through the connection of the expansion reservoir, until the maximum marking of the coolant level is reached.
- Switch off the heating, and if present, the air conditioning system as well.
- Start engine, run for not more than 2 minutes at approx. 1500 rpm and while doing so continuously top up coolant in the expansion reservoir.
- Tighten cap at expansion reservoir.
- Run engine until radiator fan starts.



#### WARNING

*When opening the expansion reservoir, out hot steam or hot coolant may escape. Cover the cap with a cloth and open carefully.*

- Check the coolant level when the expansion tank is closed and top up if necessary when the engine is cooled down.
- When engine is at operating temperature the coolant level must be at the maximum marking, when engine is cold between the minimum and the maximum markings.

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## 2 Coolant pump and coolant regulator

⇒ [“2.1 Summary of components - coolant pump and coolant regulator \(vehicles up to 08.2009\)”, page 166](#)

⇒ [“2.2 Summary of components - Coolant pump and 4/2 way valve with coolant regulator \(vehicles from 08.2009\)”, page 167](#)

⇒ [“2.3 Removing and installing coolant pump”, page 167](#)

⇒ [“2.4 Removing and installing coolant regulator - \(vehicles up to 08.2009\)”, page 168](#)

⇒ [“2.5 Removing and installing 4/2 way valve with coolant regulator \(vehicles from 08.2009\)”, page 171](#)

⇒ [“2.6 Testing the coolant regulator”, page 173](#)

### 2.1 Summary of components - coolant pump and coolant regulator (vehicles up to 08.2009)

#### 1 - Coolant pump

- ❑ Removing and installing  
⇒ [“2.3 Removing and installing coolant pump”, page 167](#)

#### 2 - Screw

- ❑ 15 Nm

#### 3 - O-ring

- ❑ Replace after removal

#### 4 - Coolant regulator

- ❑ Removing and installing  
⇒ [“2.4 Removing and installing coolant regulator - \(vehicles up to 08.2009\)”, page 168](#)
- ❑ Check  
⇒ [“2.6 Testing the coolant regulator”, page 173](#)

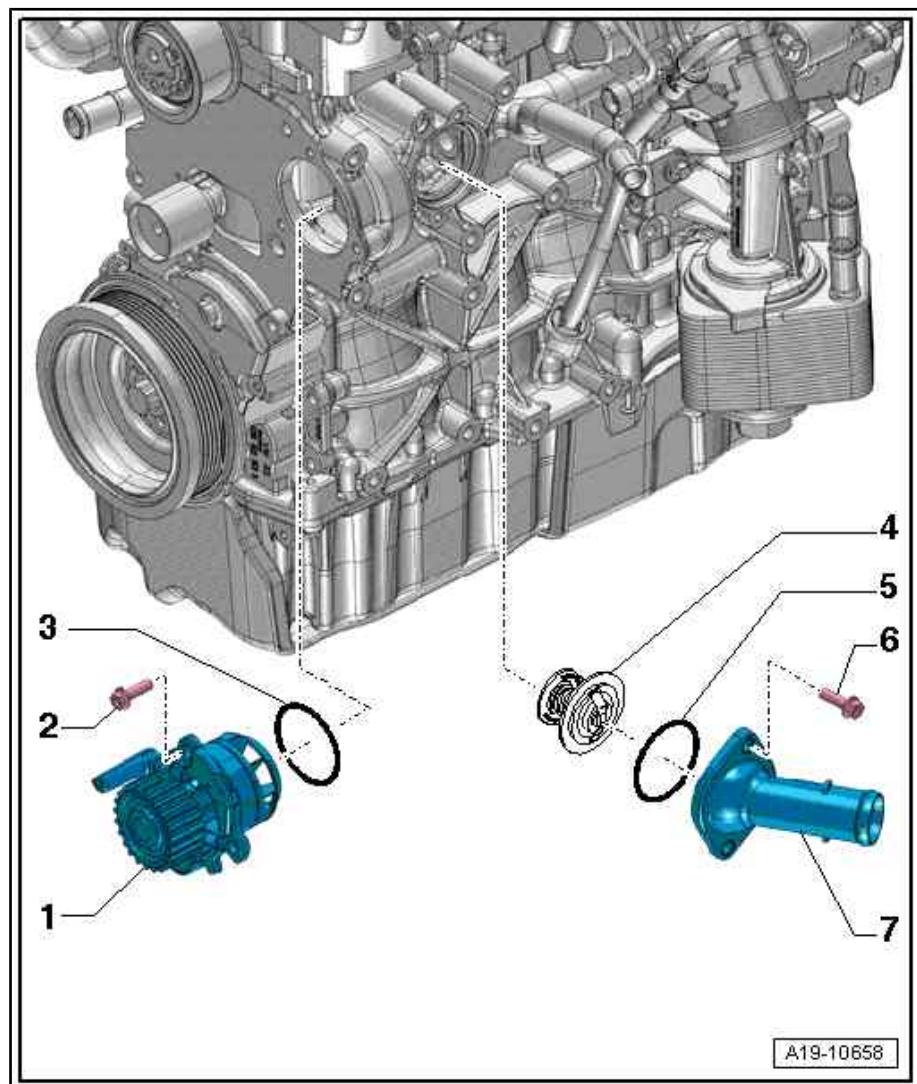
#### 5 - O-ring

- ❑ Replace after removal

#### 6 - Screw

- ❑ 13 Nm

#### 7 - Connection fitting



## 2.2 Summary of components - Coolant pump and 4/2 way valve with coolant regulator (vehicles from 08.2009)

### 1 - Coolant pump

- ❑ Removing and installing  
⇒ [“2.3 Removing and installing coolant pump”](#),  
page 167

### 2 - Screw

- ❑ 15 Nm

### 3 - O-ring

- ❑ Replace after removal

### 4 - O-ring

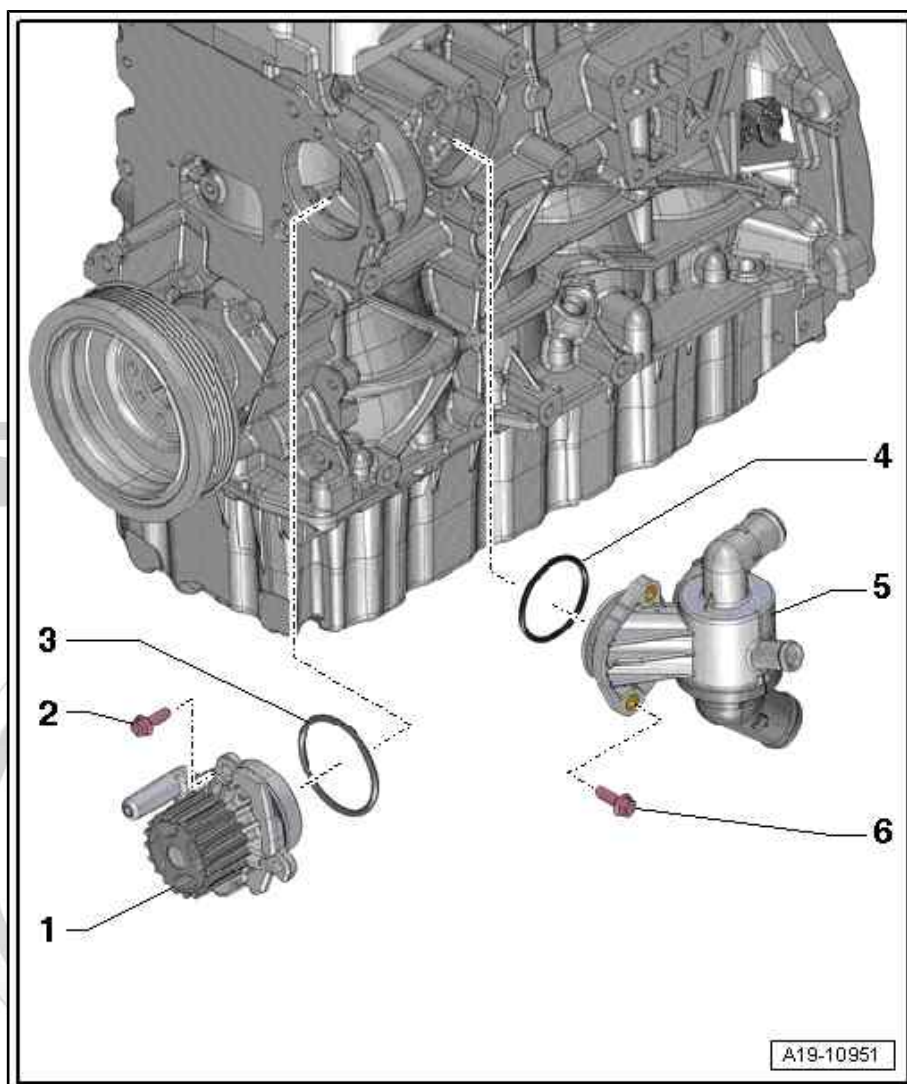
- ❑ Replace after removal

### 5 - 4/2 way valve with coolant regulator

- ❑ The coolant regulator is integrated in the 4/2 way valve and cannot be replaced separately
- ❑ Removing and installing  
⇒ [“2.5 Removing and installing 4/2 way valve with coolant regulator \(vehicles from 08.2009\)”](#), page 171

### 6 - Screw

- ❑ 13 Nm



## 2.3 Removing and installing coolant pump

### Removing

- Drain coolant ⇒ [“1.3 Draining and filling coolant”](#), page 163 .
- Remove toothed belt  
⇒ [“1.9 Removing and installing toothed belt”](#), page 55 .



- Release screws -1- and remove coolant pump -2-.
- Remove O-ring -3-.

### Installing

Installation is carried out in the reverse order. When installing, observe the following:



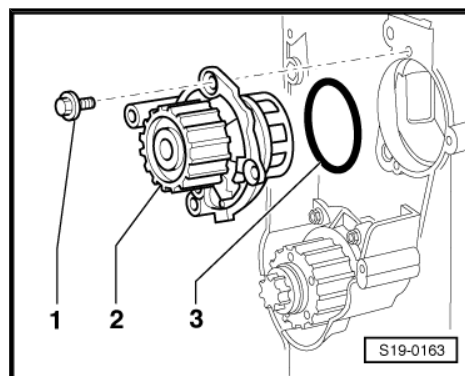
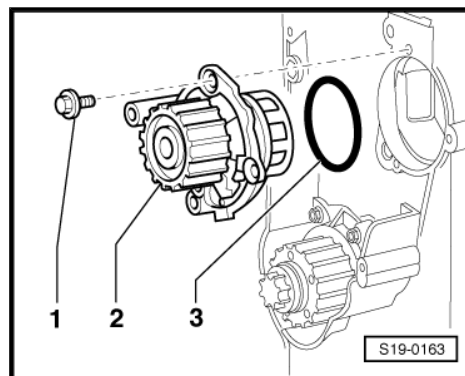
### Note

*Renew O-ring.*

- Clean sealing surface for O-ring or smoothen.
- Moisten new O-ring -3- with coolant.
- Attach the coolant pump -2-.
- Fitting position: Plug in housing points down.
- Tighten the screws -1- of the coolant pump to the specified tightening torque.
- Install the toothed belt  
⇒ ["1.9.2 Installing \(set the timing\)", page 59](#) .
- Top up coolant  
⇒ ["1.3 Draining and filling coolant", page 163](#) .

### Tightening torques

- ♦ Screws of the coolant pump (vehicles up to 08.2009)  
⇒ ["2.1 Summary of components - coolant pump and coolant regulator \(vehicles up to 08.2009\)", page 166](#)
- ♦ Screws of the coolant pump (vehicles as of 08.2009)  
⇒ ["2.2 Summary of components - Coolant pump and 4/2 way valve with coolant regulator \(vehicles from 08.2009\)", page 167](#)



## 2.4 Removing and installing coolant regulator - (vehicles up to 08.2009)

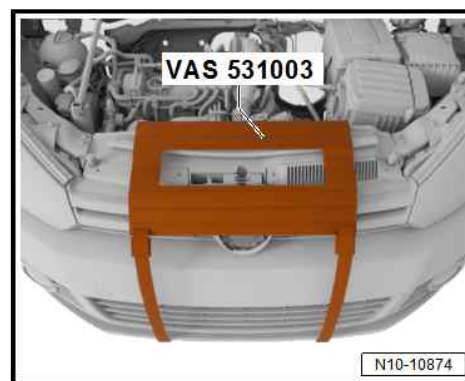
### Special tools and workshop equipment required

- ♦ Flexible-head wrench 10 - 3185-
- ♦ Socket - T10058-
- ♦ Catch pan , e.g. -VAS 6208-
- ♦ Pliers for spring-type clips
- ♦ Radiator protection mat - VAS 531003-

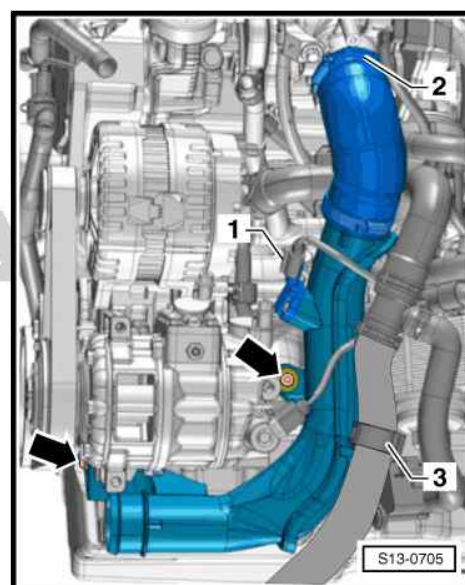
### Removing

- Drain coolant ⇒ ["1.3 Draining and filling coolant", page 163](#) .
- Remove fan shroud with radiator fans  
⇒ ["4.2 Removing and installing fan shroud for radiator fan", page 188](#) .

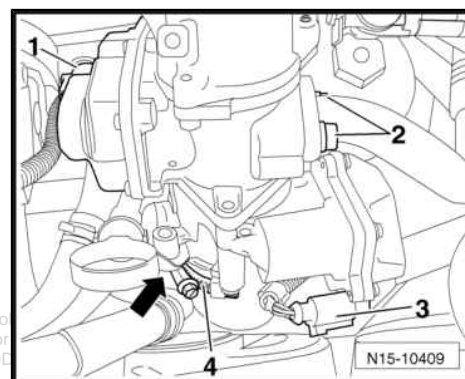
- Cover radiator with radiator protection mat - VAS 531003- .



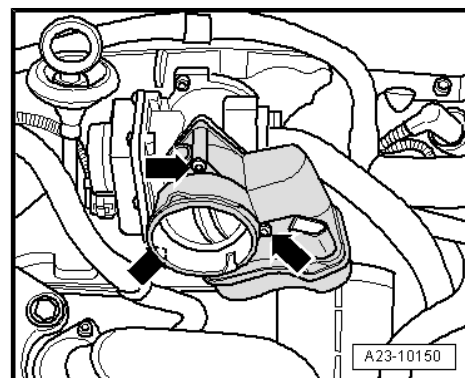
- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Loosen hose clamp -2-.
- Disconnect plug -1- at the charge pressure sender - G31- and remove the right charge air pipe.



- Disconnect the plug -3- from the throttle valve control unit - J338- .
- Release the screw -arrow- on the oil dipstick guide pipe.



- Remove screws -arrows- and remove the throttle flap control unit - J338- .

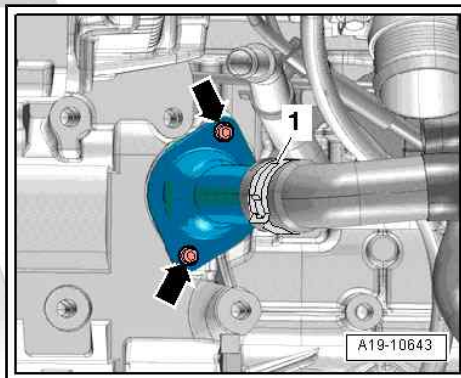


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- Remove the coolant hose from the connection fitting, to do so slacken the hose clamp -1-.
- Slacken the screws -arrows- using the flexible-head wrench - 3185- , screw out with socket insert - T10058- and remove the connection fitting.



- Turn the coolant thermostat pos. -2- approx. 90° clockwise -arrow- and remove it from the connection fitting.
- Remove O-ring -1-.

### Installing

Installation is carried out in the reverse order. When installing, observe the following:

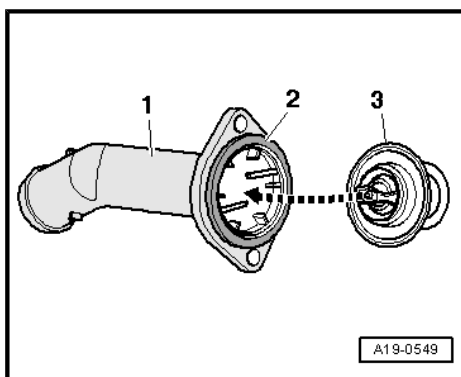
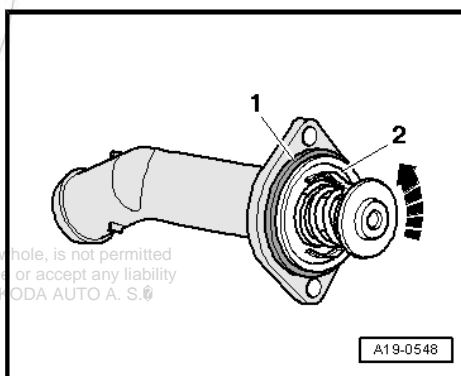


#### Note

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#### Renew O-ring.

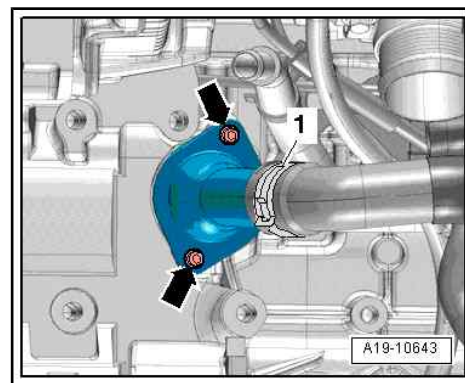
- Clean sealing surface for O-ring or smoothen.
- Insert the coolant regulator -3- with the O-ring -2-.
- Moisten O-ring -2- with coolant additive.



- Position the connection fitting onto cylinder block and tighten the screws -arrows- to the specified tightening torque.
- Top up coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#) .

#### Tightening torques

- ◆ Throttle valve control unit - J338-  
⇒ [“3.1 Summary of components - intake manifold”, page 302](#)
- ◆ Screws of the coolant regulator fitting  
⇒ [“2.1 Summary of components - coolant pump and coolant regulator \(vehicles up to 08.2009\)”, page 166](#)
- ◆ Charge air pipe Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#) .
- ◆ Charge air pipe Superb II  
⇒ [“2.2 Summary of components - Charge air cooler Superb II”, page 256](#) .
- ◆ Charge air pipe Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”, page 257](#) .



## 2.5 Removing and installing 4/2 way valve with coolant regulator (vehicles from 08.2009)

#### Special tools and workshop equipment required

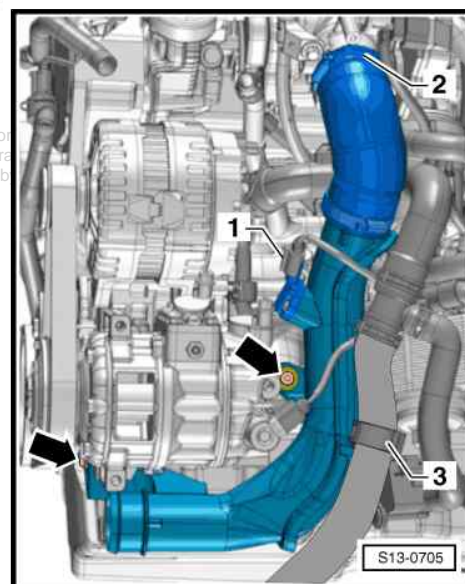
- ◆ Pliers for spring-type clips
- ◆ Universal joint socket wrench XZN 8 - T10445-



#### Note

*The coolant regulator is located inside the 4/2 way valve and cannot be replaced separately.*

- Drain coolant ⇒ [“1.3 Draining and filling coolant”, page 163](#) .
- Remove the generator ⇒ Electrical System; Rep. gr. 27 .
- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Loosen hose clamp -2-.
- Disconnect plug -1- at the charge pressure sender - G31- and remove the right charge air pipe.

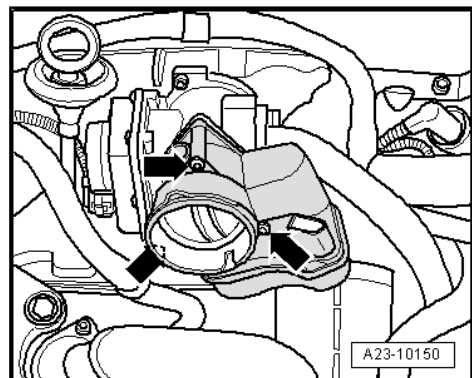
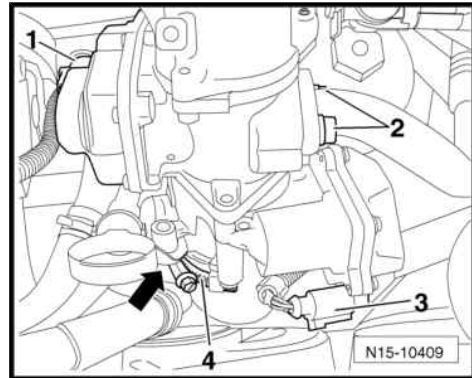




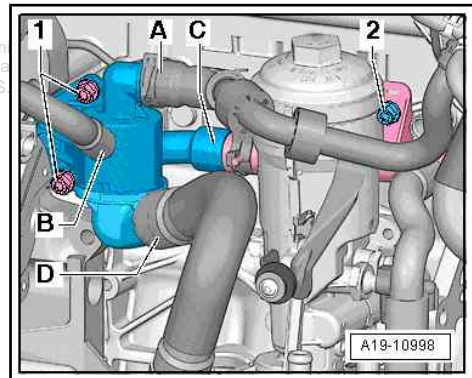
- Disconnect the plug -3- from the throttle valve control unit - J338- .
- Release the screw -arrow- on the oil dipstick guide pipe.

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- Remove screws -arrows- and remove the throttle flap control unit - J338- .



- Remove the coolant hoses from the connection fittings -A-, -B- and -D-.
- Unscrew fixing screws -1- for 4/2 way valve with coolant regulator -2-.
- Unscrew the screw of the front coolant pipe behind the oil filter holder using the universal joint socket wrench XZN 8 - T10445- .
- Remove the wiring loom between the front coolant pipe and the oil filter holder and place it to the side.
- Remove the 4/2 way valve with coolant regulator from the cylinder block and then push it to the left in order to separate the connection fitting -C- from the front coolant pipe.



## Installing

Assembly is carried out in the reverse order. When installing, observe the following:

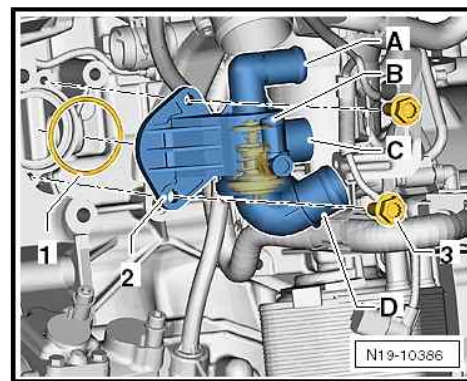


### Note

- ◆ *Renew O-ring.*
- ◆ *Hose connections as well as charge air pipes and charge air hoses must be free of oil and grease before being installed.*
- ◆ *Observe the instructions for installing the charge air hoses ⇒ "2.6 Hose connections", page 261 .*
- ◆ *Secure all hose connections with prescribed clamps ⇒ ETKA - Electronic Catalogue of Original Parts .*

- First of all position the 4/2 way valve with coolant regulator with the connection fitting -C- on the front coolant pipe and subsequently press it into the cylinder block.
- Screw in fixing screws -3- for 4/2 way valve with coolant regulator -2-.
- Connect the coolant hoses to the connection fittings -A-, -B- and -D-.
- Tighten the screw of the front coolant pipe behind the oil filter holder using the universal joint socket wrench XZN 8 - T10445- .

Tightening torque: 10 Nm



- Install the throttle valve control unit - J338-  
⇒ [“3.2 Removing and installing the throttle valve control unit J338”](#), page 303 .
- Install generator ⇒ Electrical System; Rep. gr. 27 .
- Top up coolant  
⇒ [“1.3 Draining and filling coolant”](#), page 163 .

#### Tightening torques

- ◆ Throttle valve control unit - J338-  
⇒ [“3.1 Summary of components - intake manifold”](#), page 302
- ◆ Screws of the coolant regulator fitting  
⇒ [“2.1 Summary of components - coolant pump and coolant regulator \(vehicles up to 08.2009\)”](#), page 166
- ◆ Charge air pipe Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”](#), page 255 .
- ◆ Charge air pipe Superb II  
⇒ [“2.2 Summary of components - Charge air cooler Superb II”](#), page 256 .
- ◆ Charge air pipe Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”](#), page 257 .

## 2.6 Testing the coolant regulator

- Heat up the removed coolant regulator in a water bath.

Start of opening	End of opening	Opening stroke
approx. 87 °C	approximately 102 °C <sup>1)</sup>	min. 7 mm
Note: <sup>1)</sup> Cannot be tested.		





### 3 Parts of cooling system engine side

⇒ ["3.1 Summary of components - Parts of cooling system engine side", page 174](#)

⇒ ["3.2 Replace coolant temperature sender G62 ", page 175](#)

⇒ ["3.3 Replace coolant temperature sender at radiator outlet G83 ", page 177](#)

⇒ ["3.4 Remove and install coolant recirculation pump 2 V178 ", page 177](#)

⇒ ["3.5 Removing and installing the front coolant pipe", page 179](#)

⇒ ["3.6 Remove and install the left coolant pipe", page 183](#)

⇒ ["3.7 Removing and installing the right coolant pipe", page 185](#)

#### 3.1 Summary of components - Parts of cooling system engine side

##### 1 - Grommet

- ☐ is not supplied individually

##### 2 - Bushing

- ☐ is not supplied individually

##### 3 - Screw

- ☐ 3 Nm

##### 4 - Screw

- ☐ 40 Nm

##### 5 - Mounting bracket

- ☐ Coolant recirculation pump 2 - V178-

##### 6 - Coolant pipe - front

- ☐ Removing and installing  
⇒ ["3.5 Removing and installing the front coolant pipe", page 179](#)

##### 7 - O-ring

- ☐ Replace after removal

##### 8 - Coolant pipe - right

- ☐ Removing and installing  
⇒ ["3.7 Removing and installing the right coolant pipe", page 185](#)

##### 9 - O-ring

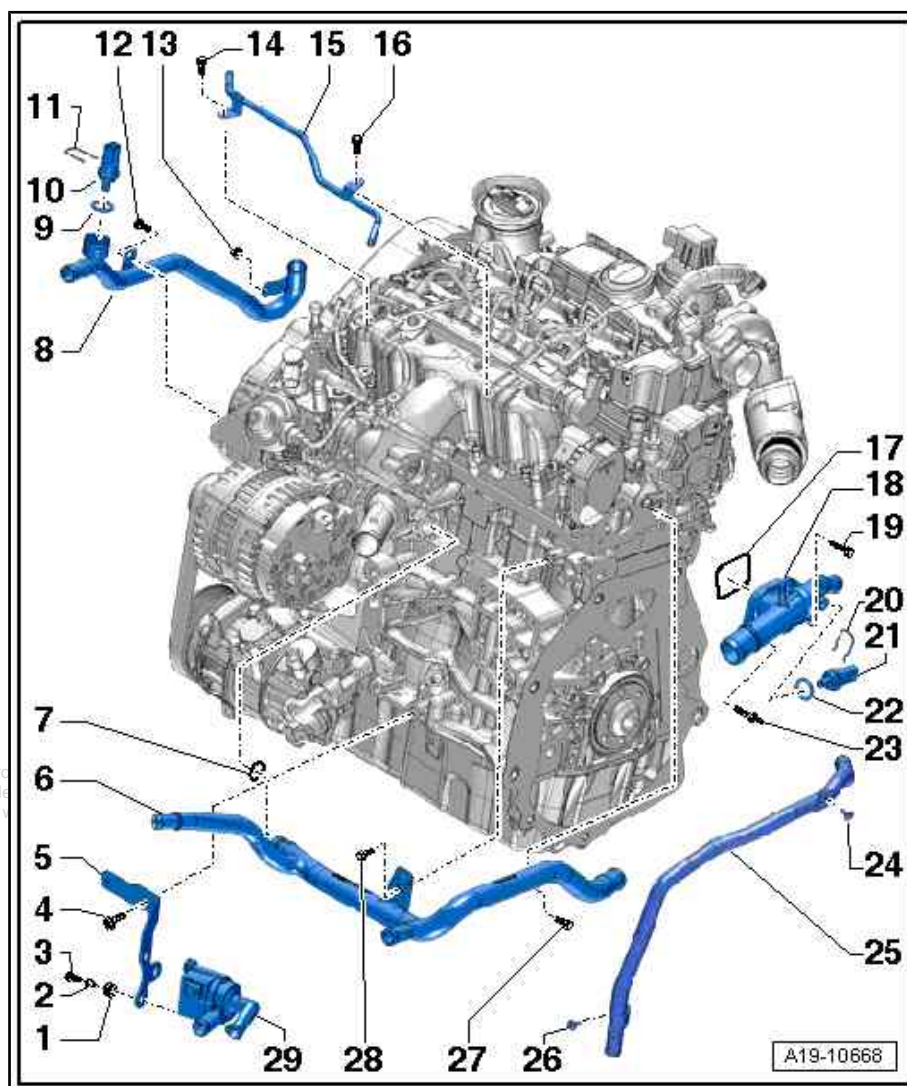
- ☐ Replace after removal

##### 10 - Coolant temperature sender at radiator outlet - G83-

- ☐ Replace  
⇒ ["3.3 Replace coolant temperature sender at radiator outlet G83 ", page 177](#)

##### 11 - Retaining clip

- ☐ check correct fitting



**12 - Screw**

- ☐ 9 Nm

**13 - Nut**

- ☐ 9 Nm

**14 - Screw**

- ☐ 9 Nm

**15 - Coolant line**

**16 - Screw**

- ☐ 9 Nm

**17 - Seal**

- ☐ Replace after removal

**18 - Connection fitting**

- ☐ for cylinder head

**19 - Screw**

- ☐ 9 Nm

**20 - Retaining clip**

- ☐ check correct fitting

**21 - Coolant temperature sender - G62-**

- ☐ Replace ⇒ ["3.2 Replace coolant temperature sender G62 ", page 175](#)

**22 - O-ring**

- ☐ Replace after removal

**23 - Double screw**

- ☐ 9 Nm

**24 - Screw**

- ☐ 9 Nm

**25 - Coolant pipe - left**

- ☐ Removing and installing ⇒ ["3.6 Remove and install the left coolant pipe", page 183](#)

**26 - Nut**

- ☐ 9 Nm

**27 - Screw**

- ☐ 40 Nm

**28 - Screw**

- ☐ 13 Nm

**29 - Coolant recirculation pump 2 - V178-**

- ☐ Removing and installing ⇒ ["3.4 Remove and install coolant recirculation pump 2 V178 ", page 177](#)

## 3.2 Replace coolant temperature sender - G62-

### Condition

- Engine cold

### Work procedure

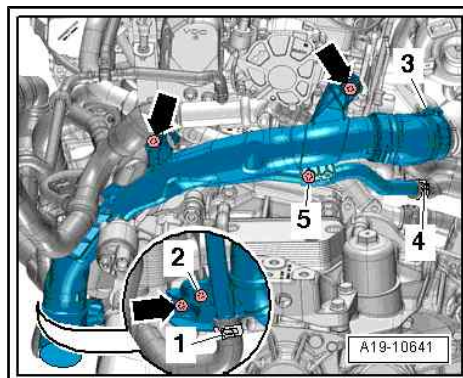
- Briefly open the cap for the coolant expansion reservoir in order to adjust the pressure in the cooling system.
- Remove air filter housing  
⇒ ["3.5 Removing and installing air filter housing", page 307](#) .

- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .

#### For the vehicles Superb II up to 10.2008

- Unscrew screws -2- and -5- and screws -arrows-.

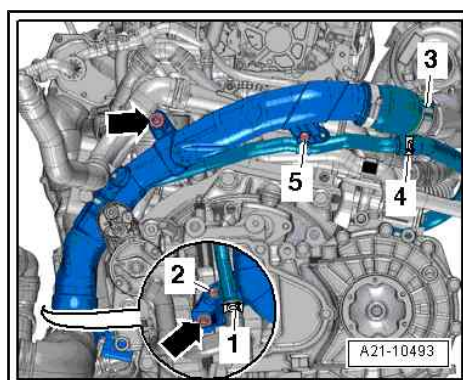
#### For the vehicles Superb II from 11.2008, Octavia II, Yeti



- Screw out screws -arrows- and screw -5-.

#### Continued for all vehicles

- Release the screw clamp -3- and push the left charge air pipe as well as the left coolant pipe to the left.

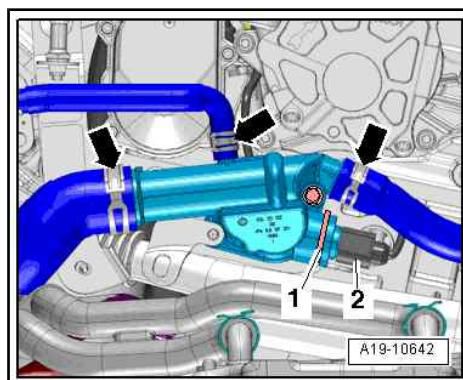


- Disconnect plug -2- at the coolant temperature sender - G62- .



#### Note

- ♦ In order to collect flowing out coolant, place a cloth below the connection fitting.
- ♦ Have a new coolant temperature sender - G62- with a new gasket ring ready.
- Remove the holding clamps -1-, remove the coolant temperature sender - G62- from the connection fitting, and immediately replace with a new one.



Further installation occurs in reverse order.

- Inspect coolant level, top up with coolant if necessary  
⇒ ["1.3 Draining and filling coolant", page 163](#) .

#### Tightening torques

- ♦ Charge air pipe Octavia II  
⇒ ["2.1 Summary of components - Charge air cooler Octavia II", page 255](#) .
- ♦ Charge air pipe Superb II  
⇒ ["2.2 Summary of components - Charge air cooler Superb II", page 256](#) .
- ♦ Charge air pipe Yeti  
⇒ ["2.3 Summary of components - Charge air cooler Yeti", page 257](#) .

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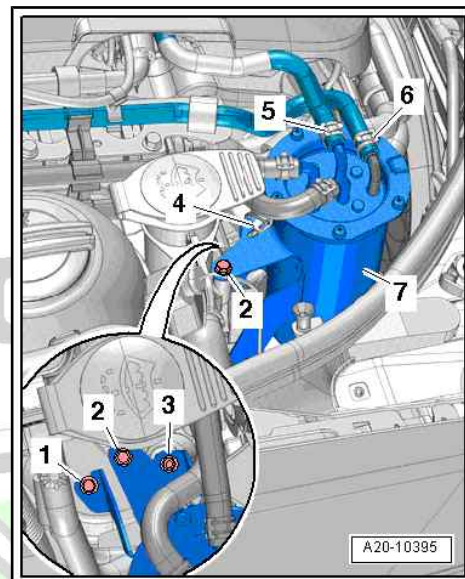
### 3.3 Replace coolant temperature sender at radiator outlet - G83-

#### Condition

- Engine cold

#### Work procedure

- Briefly open the cap for the coolant expansion reservoir in order to adjust the pressure in the cooling system.
- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .
- Release screw -1-.
- Release screw -2- and nut -3-.
- Remove the hose bracket -4- from the fuel filter, lay the fuel filter -7- with the connected fuel hoses to the side.



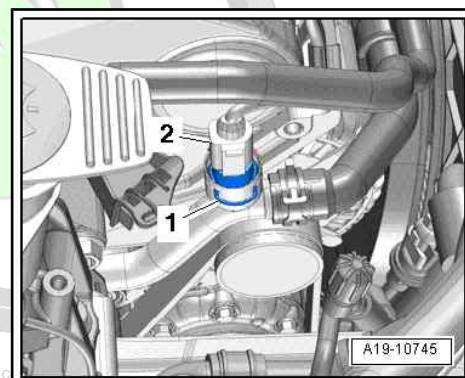
- Disconnect plug -2- at the coolant temperature sender at radiator outlet - G83- .



#### Note

- ◆ *In order to collect flowing out coolant, place a cloth below the right coolant pipe.*
- ◆ *Have a new coolant temperature sender at radiator outlet - G83- with a new gasket ring ready.*

- Remove the holding clamps -1-, remove the coolant temperature sender - G83- from the connection fitting, and immediately replace with a new one.



Further installation occurs in reverse order.

- Install fuel filter  
⇒ [“2.3 Summary of components - fuel filter”, page 204](#) .
- Inspect coolant level, top up with coolant if necessary  
⇒ [“1.3 Draining and filling coolant”, page 163](#) .

#### Tightening torques

- ◆ Fuel filter  
⇒ [“2.3 Summary of components - fuel filter”, page 204](#)

### 3.4 Remove and install coolant recirculation pump 2 - V178-

Special tools and workshop equipment required

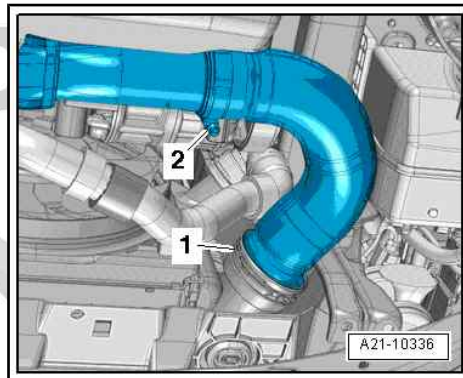




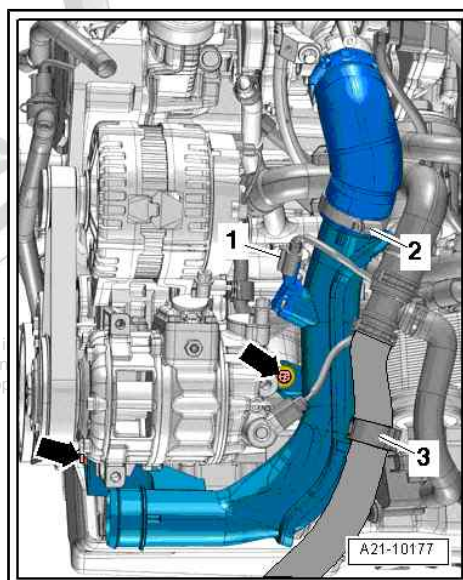
- ◆ Hose clamps up to 25 mm - MP7-602 (3094)-
- ◆ Pliers for spring-type clips

### Removing

- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .
- Remove the right charge air hose, to do so loosen the hose clamp -2- and raise the clamp -1-.



- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Slacken the hose clamp -2- and push the charge air pipe to the right.

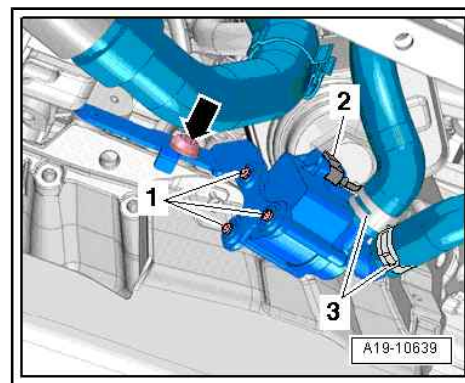


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## Note

*In order to collect flowing out coolant, place a cloth below the coolant recirculation pump 2 - V178- .*

- Pinch off the coolant hoses with hose clamps up to a diameter of 25 mm - MP7-602- , slacken spring strap clamps -3- and detach the hoses.
- Disconnect plug connection -2-.
- Release screws -1- and remove coolant recirculation pump 2 - V178- .



## Installing

Installation is carried out in the reverse order. When installing, observe the following:

## Note

- ◆ *Hose connections as well as charge air pipes and charge air hoses must be free of oil and grease before being installed.*
- ◆ *Observe the assembly instruction for hose connections with push-fit couplings ⇒ [“2.6 Hose connections”, page 261](#) .*
- Inspect coolant level, top up with coolant if necessary  
⇒ [“1.3 Draining and filling coolant”, page 163](#) .

## Tightening torques

- ◆ Charge air pipe Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#) .
- ◆ Charge air pipe Superb II  
⇒ [“2.2 Summary of components - Charge air cooler Superb II”, page 256](#) .
- ◆ Charge air pipe Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”, page 257](#) .
- ◆ Screws for coolant recirculation pump 2 - V178-  
⇒ [“3.1 Summary of components - Parts of cooling system engine side”, page 174](#)

## 3.5 Removing and installing the front coolant pipe

### Special tools and workshop equipment required

- ◆ Pliers for spring-type clips

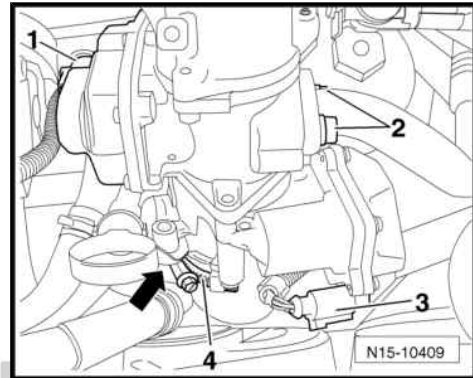
### Removing

- Remove air filter housing  
⇒ [“3.5 Removing and installing air filter housing”, page 307](#) .
- Remove oil filter holder  
⇒ [“1.12 Removing and installing the oil filter holder with the engine oil cooler”, page 153](#) .
- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .

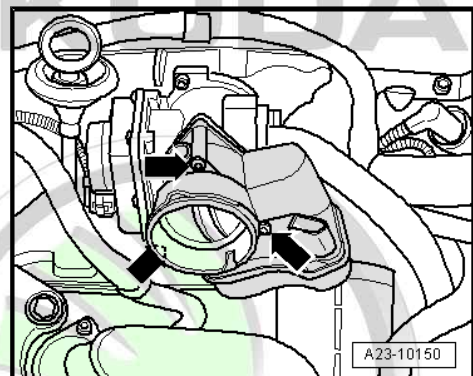
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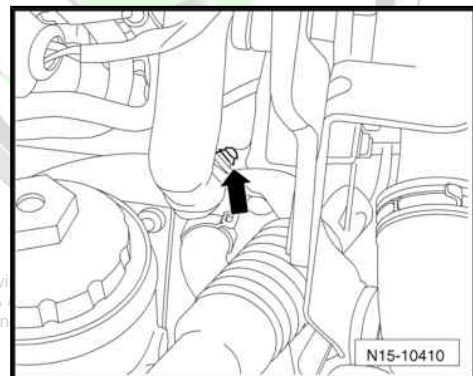
- Disconnect the plug -3- from the throttle valve control unit - J338- .
- Release screws -2- on exhaust gas recirculation pipe.



- Remove screws -arrows- and remove the throttle flap control unit - J338- .



- Unclip the wiring loom from the holder -arrow-.

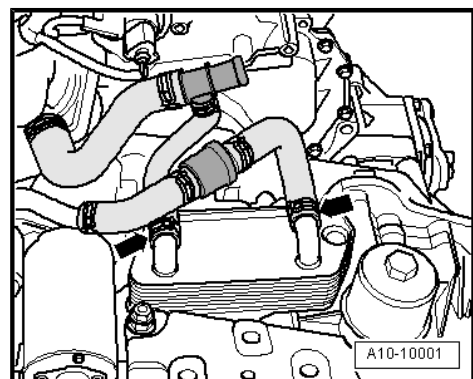


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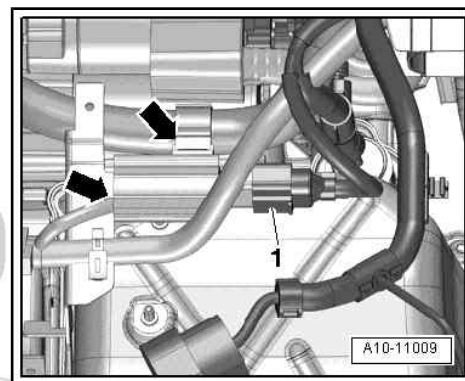
### Vehicles with automatic gearbox

- Pull off the coolant hoses from the gearbox oil cooler, to do so slacken the hose clamps -arrows-.



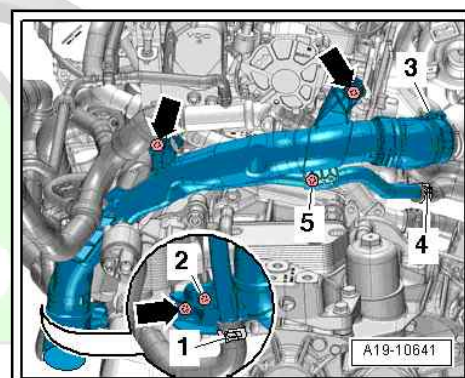
# **Continued for all vehicles**

- Expose the wiring looms -arrows- and the electrical plug connection -1- on the bracket.



# **For the vehicles Superb II up to 10.2008**

- Unscrew screws -2- and -5- and screws -arrows-.

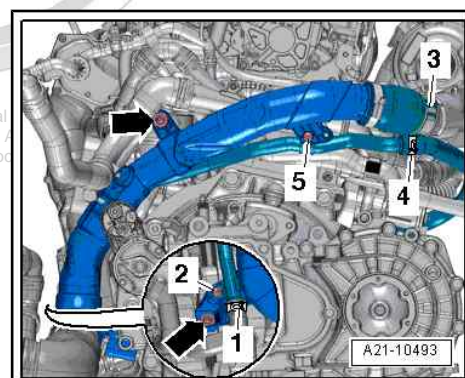


# **For the vehicles Superb II from 11.2008, Octavia II, Yeti**

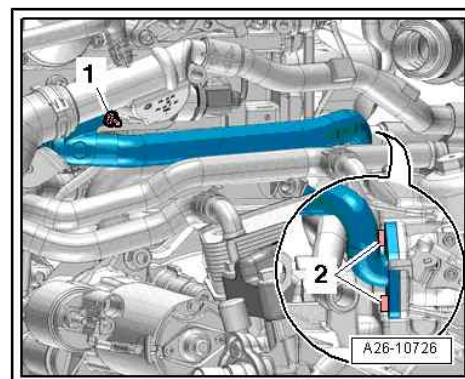
- Screw out screws -arrows- and screw -5-.

# **Continued for all vehicles**

- Release screw clamp -3- and remove left charge air pipe.



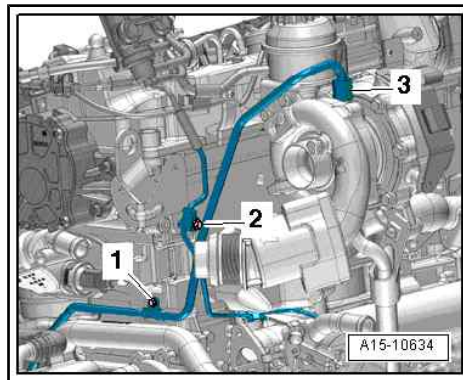
- Release nut -1- and screw -2-, remove exhaust gas recirculation pipe.







- Release the nut -2- at the retaining clip for the vacuum line.
- Release screw -1-.
- Unscrew the oil feed line from the exhaust turbocharger; when slackening the union nut -3- counterhold the connection on the hexagon with a lateral wrench.



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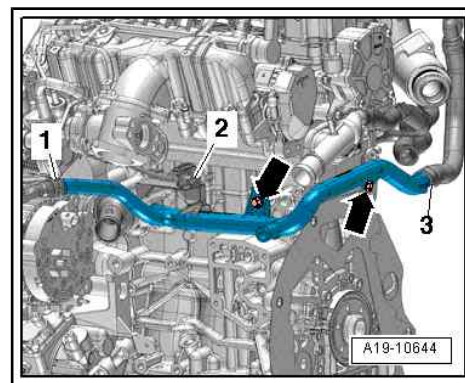


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- Remove the plug connection -2- for the hall sender - G40- from the bracket and disconnect.
- Remove the bracket from the coolant pipe.
- Remove the coolant hoses, to do so slacken the spring strap clamps -1- and -3-.
- Unscrew screws -arrows- and detach the front coolant pipe from the cylinder block to the left.

### Installing

Installation is carried out in the reverse order. When installing, observe the following:



### Note

*Replace gaskets, gasket rings and O-rings.*

- Clean sealing surface for O-ring or smoothen.
- Moisten O-ring with coolant and fit onto front coolant pipe.
- Slide the front coolant pipe into the cylinder block.
- Install the oil feed line  
⇒ [“1.1 Summary of components - exhaust gas turbocharger with component parts”, page 237](#) .
- Install exhaust gas recirculation pipe  
⇒ [“2.1 Summary of components - Exhaust gas recirculation with radiator”, page 328](#) .
- Install the left charge air pipe:
- Install the throttle valve control unit - J338-  
⇒ [“3.2 Removing and installing the throttle valve control unit J338”, page 303](#) .
- Top up coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#) .

### Tightening torques

- ◆ Parts of the cooling system  
⇒ [“3.1 Summary of components - Parts of cooling system engine side”, page 174](#) .
- ◆ Charge air pipe Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#) .
- ◆ Charge air pipe Superb II  
⇒ [“2.2 Summary of components - Charge air cooler Superb II”, page 256](#) .
- ◆ Charge air pipe Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”, page 257](#) .

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## 3.6 Remove and install the left coolant pipe

### Special tools and workshop equipment required

- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Hose clamps up to 25 mm - MP7-602 (3094)-
- ◆ Pliers for spring-type clips



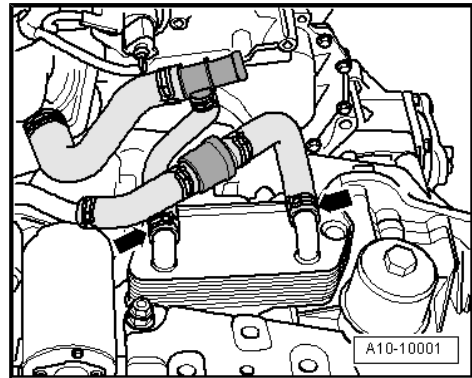
## Removing

- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .
- Remove air filter housing with air mass meter - G70-  
⇒ ["3.5 Removing and installing air filter housing", page 307](#) .

## Vehicles with automatic gearbox

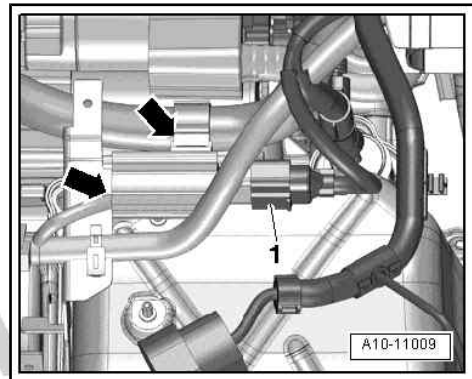
- Pinch off coolant hoses with hose clamps up to 25 mm - MP7-602- and remove from gearbox oil cooler, to do so slacken spring strap clamps -3-.

## Continued for all vehicles



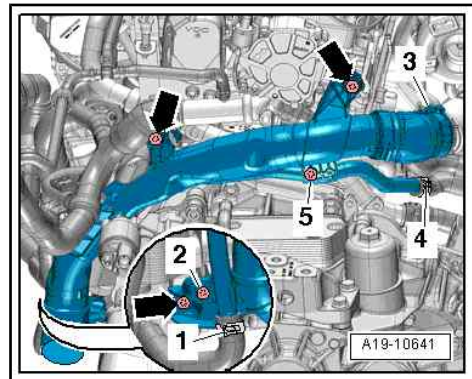
- Expose the wiring looms -arrows- and the electrical plug connection -1- on the bracket.

## For the vehicles Superb II up to 10.2008



- Unscrew screws -2- and -5- and screws -arrows-.

## For the vehicles Superb II from 11.2008, Octavia II, Yeti



- Screw out screws -arrows- and screw -5-.

#### Continued for all vehicles

- Release screw clamp -3- and remove left charge air pipe.
- Place a catch pan - VAS 6208- under the engine.
- Pinch off the coolant hoses with hose clamps - MP7-602- and remove from the left coolant pipe, to do so slacken the spring strap clamps -1- and -4-.
- Remove the left coolant pipe.

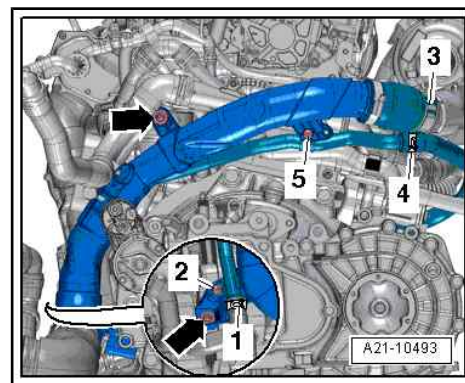
#### Installing

Installation is carried out in the reverse order. When installing, observe the following:

- Install the left charge air pipe:
- Install the left charge air pipe  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#) .
- Top up coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#) .

#### Tightening torques

- ◆ Parts of the cooling system  
⇒ [“3.1 Summary of components - Parts of cooling system engine side”, page 174](#) .
- ◆ Charge air pipe Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#) .
- ◆ Charge air pipe Superb II  
⇒ [“2.2 Summary of components - Charge air cooler Superb II”, page 256](#) .
- ◆ Charge air pipe Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”, page 257](#) .



## 3.7 Removing and installing the right coolant pipe

#### Special tools and workshop equipment required

- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Hose clamps up to 25 mm - MP7-602 (3094)-
- ◆ Pliers for spring-type clips

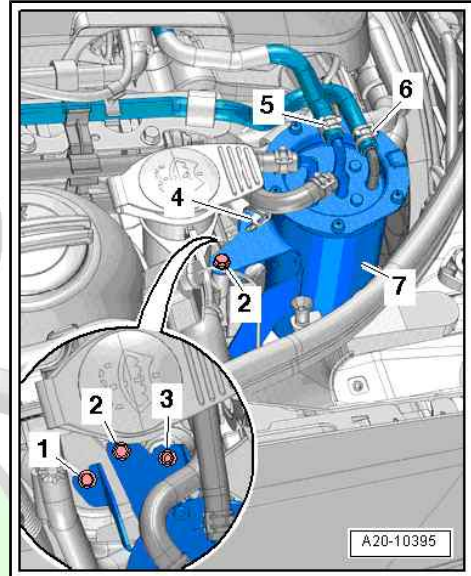
#### Removing

- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .





- Release screw -1-.
- Release screw -2- and nut -3-.
- Remove the hose bracket -4- from the fuel filter, lay the fuel filter -7- with the connected fuel hoses to the side.
- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .
- Remove the right wheelhouse liner bottom part ⇒ Body Work; Rep. gr. 66 .
- Place a catch pan - VAS 6208- under the engine.

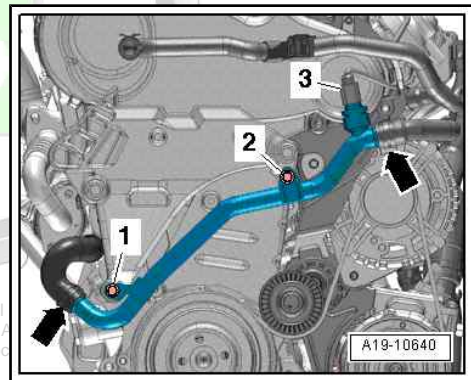


- Disconnect plug -3- at the coolant temperature sender at radiator outlet - G83- .
- Pinch off the coolant hoses with hose clamps - MP7-602- and remove from the right coolant pipe, to do so slacken the spring strap clamps -arrows-.
- Release nut -1- and screw -2-, remove coolant pipe.

### Installing

Installation is carried out in the reverse order. When installing, observe the following:

- Install fuel filter  
⇒ ["2.3 Summary of components - fuel filter", page 204](#) .
- Top up coolant  
⇒ ["1.3 Draining and filling coolant", page 163](#) .



### Tightening torques

- ◆ Parts of the cooling system  
⇒ ["3.1 Summary of components - Parts of cooling system engine side", page 174](#) .
- ◆ Fuel filter  
⇒ ["2.3 Summary of components - fuel filter", page 204](#)

## 4 Radiator and radiator fan

⇒ [“4.1 Summary of components - Radiator and radiator fan”, page 187](#)

⇒ [“4.2 Removing and installing fan shroud for radiator fan”, page 188](#)

⇒ [“4.3 Removing and installing radiator”, page 189](#)

⇒ [“4.4 Check cooling system for leaks”, page 191](#)

### 4.1 Summary of components - Radiator and radiator fan

#### 1 - Top coolant hose

- ☐ to connection fitting laterally at cylinder head
- ☐ Connection diagram for coolant hoses:

◆ Vehicles up to 08.2009  
⇒ [“1.1 Connection diagram for coolant hoses for vehicles up to 08.2009”, page 160](#)

◆ Vehicles as of 08.2009  
⇒ [“1.2 Connection diagram for coolant hoses for vehicles from 08.2009”, page 162](#)

#### 2 - O-ring

- ☐ Replace if damaged.

#### 3 - Radiator

- ☐ Removing and installing  
⇒ [“4.3 Removing and installing radiator”, page 189](#)
- ☐ After replacing, fill with fresh coolant  
⇒ [“1.3 Draining and filling coolant”, page 163](#)

#### 4 - Screw cap

- ☐ Test pressure 0.14...0.16 MPa (1.4...1.6 bar)
- ☐ Check  
⇒ [“4.4.1 Checking with the cooling system testing device V.A.G 1274”, page 191](#)

#### 5 - Connector

#### 6 - Screw

- ☐ 3 Nm

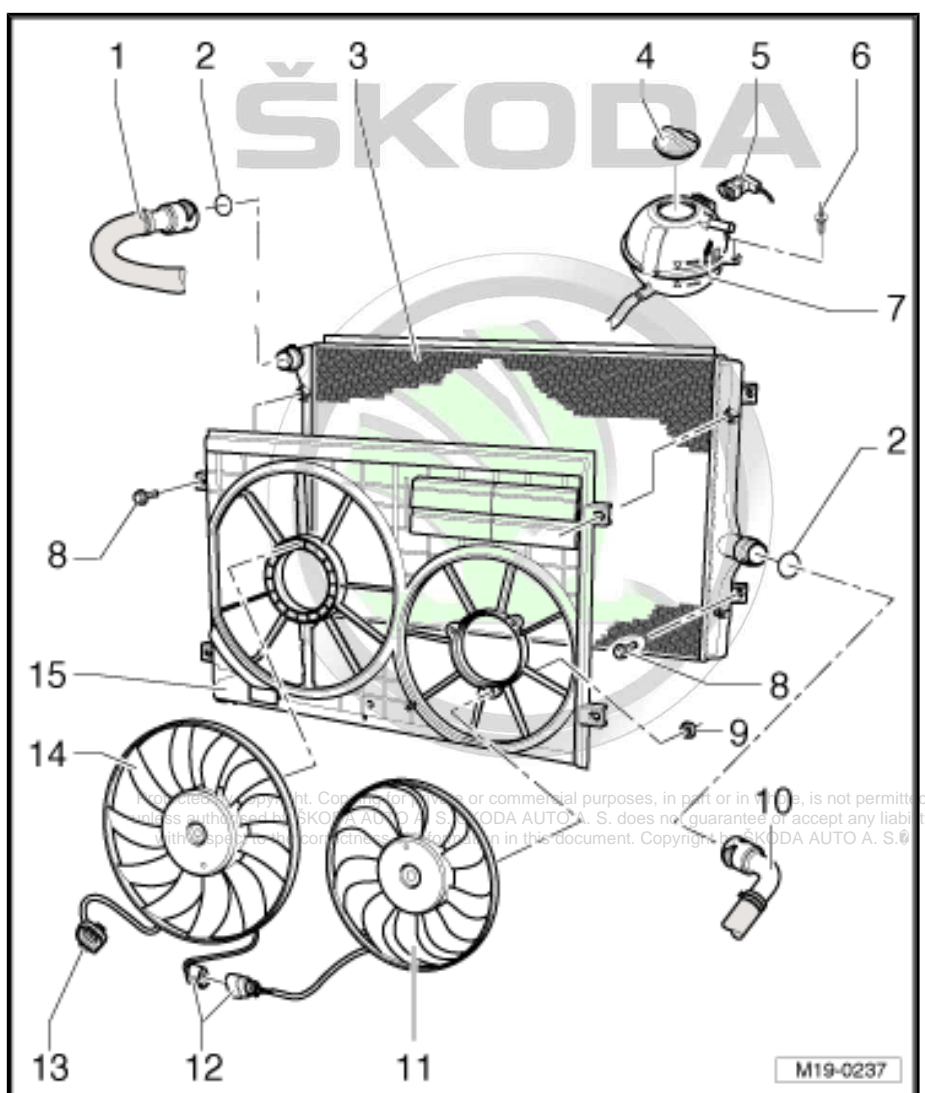
#### 7 - expansion reservoir

#### 8 - Screw

- ☐ 5 Nm

#### 9 - Nut

- ☐ 5 Nm



## 10 - Bottom coolant hose

- ☐ to connection fitting for coolant regulator at cylinder block
- ☐ Connection diagram for coolant hoses:

### ♦ Vehicles up to 08.2009

⇒ ["1.1 Connection diagram for coolant hoses for vehicles up to 08.2009", page 160](#)

### ♦ Vehicles as of 08.2009

⇒ ["1.2 Connection diagram for coolant hoses for vehicles from 08.2009", page 162](#)

## 11 - Right radiator fan - V35-

- ☐ Removing and installing ⇒ ["4.2 Removing and installing fan shroud for radiator fan", page 188](#)

## 12 - Connector

## 13 - Connector

## 14 - Radiator fan - V7-

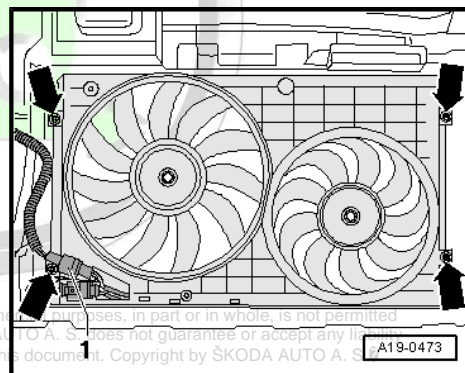
- ☐ with radiator fan control unit - J293-
- ☐ Removing and installing ⇒ ["4.2 Removing and installing fan shroud for radiator fan", page 188](#)

## 15 - Fan shroud

## 4.2 Removing and installing fan shroud for radiator fan

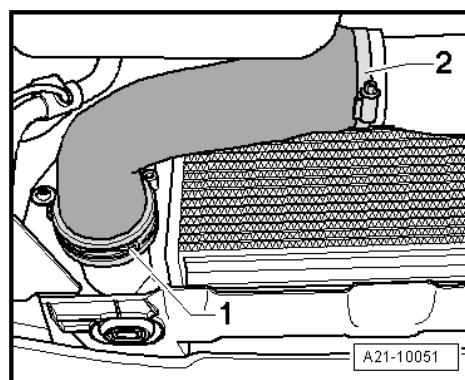
### Removing

- Unscrew top screws -arrows- at the top of the fan shroud.
- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .

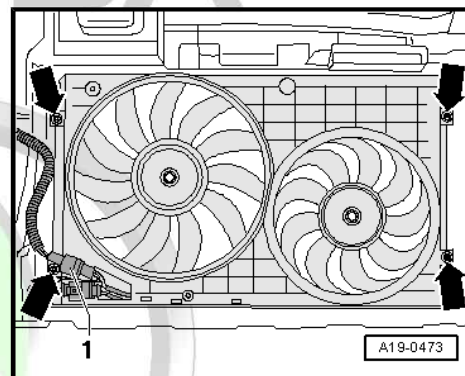


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- Remove the left charge air hose, to do so loosen the hose clamp -2- and raise the clamp -1-.



- Disconnect plug connection -1-.
- Unscrew bottom screws -arrows- at the bottom of the fan shroud.
- Remove fan shroud with radiator fans downwards.



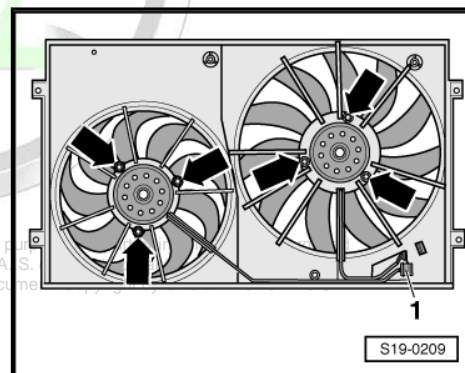
- Disconnect the plug connection -1- and expose cables.
- Unscrew the nuts -arrows- and remove the radiator fan from the fan shroud.

#### Installing

Assembly is carried out in the reverse order. When installing, observe the following:

#### Tightening torques

- ◆ Screws of the fan shroud  
⇒ [“4.1 Summary of components - Radiator and radiator fan”, page 187](#).



### 4.3 Removing and installing radiator

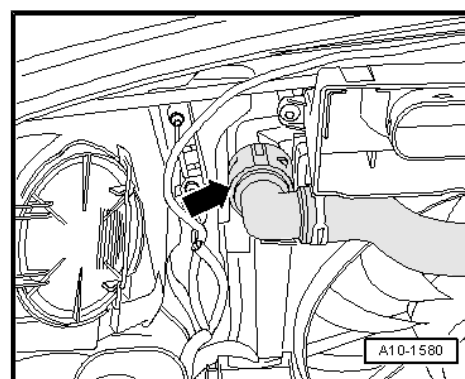
#### Special tools and workshop equipment required

- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Pliers for spring-type clips

#### Removing

- Drain coolant ⇒ [“1.3 Draining and filling coolant”, page 163](#).
- Pull off left coolant hose from radiator -arrow-.
- Remove fan shroud with radiator fans  
⇒ [“4.2 Removing and installing fan shroud for radiator fan”, page 188](#).

For vehicles with air conditioning

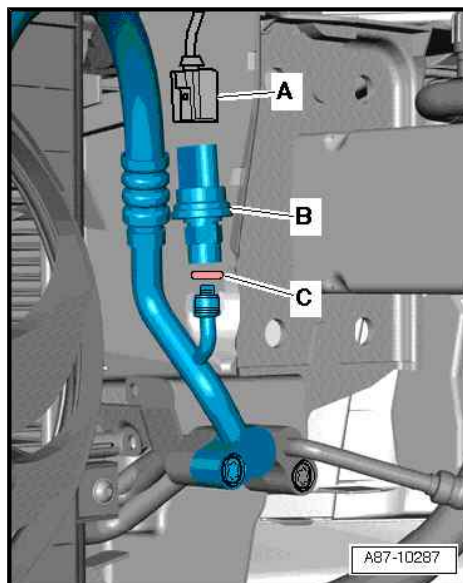




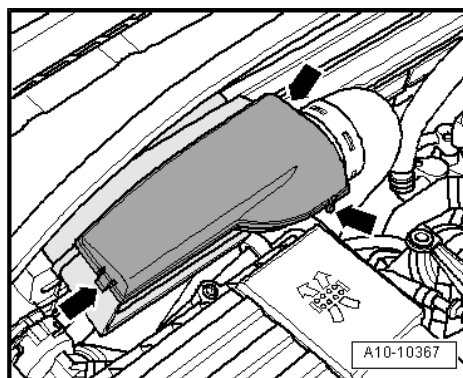


- Disconnect plug -A- on the high pressure sender - G65- -B-.

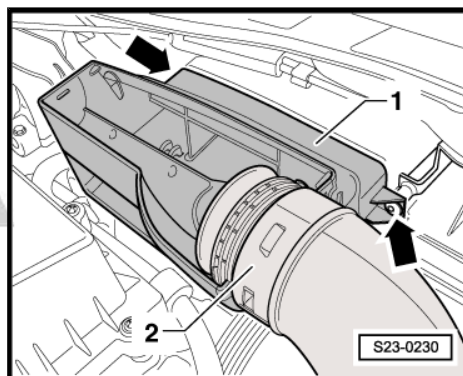
Continued for all vehicles



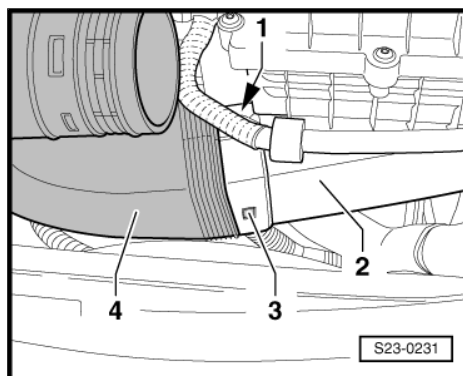
- Remove cover for connection fitting, to do so release lateral retaining clasps -arrows-.



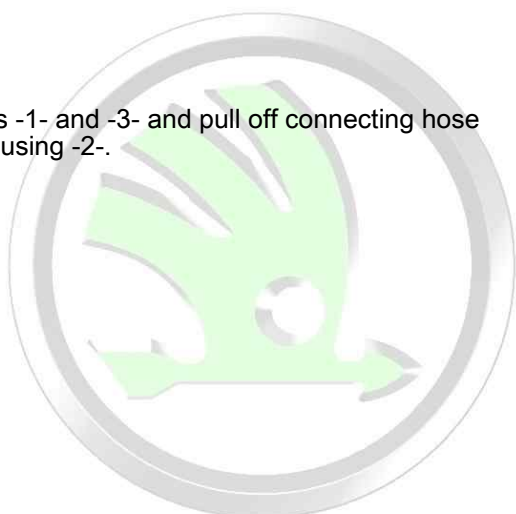
- Release screws -arrows- for connection fitting -1- and take connecting hose -2- out of the guide.



- Press in catch pegs -1- and -3- and pull off connecting hose -4- from air filter housing -2-.



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- Screw out screws -arrows- and remove the radiator upwards.

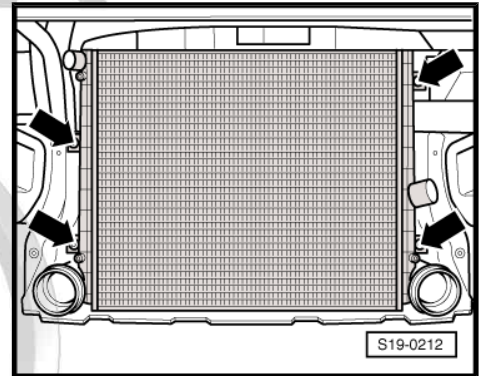
### Installing

Installation is carried out in the reverse order. When installing, observe the following:



#### Caution

**Replace all the coolant when installing the new cooler**  
⇒ **"1.3 Draining and filling coolant", page 163**



#### Note

- ◆ Replace gasket rings and O-rings.
- ◆ Secure all hose connections with corresponding hose clips.

- Top up coolant  
⇒ **"1.3 Draining and filling coolant", page 163**.

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## 4.4 Check cooling system for leaks

⇒ **"4.4.1 Checking with the cooling system testing device V.A.G 1274", page 191**

⇒ **"4.4.2 Checking with the cooling system testing device V.A.G 1274 B", page 192**

### 4.4.1 Checking with the cooling system testing device - V.A.G 1274-

#### Special tools and workshop equipment required

- ◆ Cooling system testing device , e.g. -V.A.G 1274-
- ◆ Adapter , e.g. -V.A.G 1274/8-
- ◆ Adapter , e.g. -V.A.G 1274/9-

#### Test condition

- Engine must be warm.

#### Test sequence



#### WARNING

**When opening the expansion reservoir, out hot steam or hot coolant may escape.**

- ◆ **Wear safety goggles and safety clothing to avoid eye injuries and scalding.**
- ◆ **Cover the cap with a cloth and open carefully.**

- Open the cap of the coolant expansion reservoir.



- Position tester - V.A.G 1274- with adapter - V.A.G 1274/8- on the expansion reservoir.
- Generate a pressure of approx. 0.1 MPa (1.0 bar) for testing the cooling system.

If pressure drops:

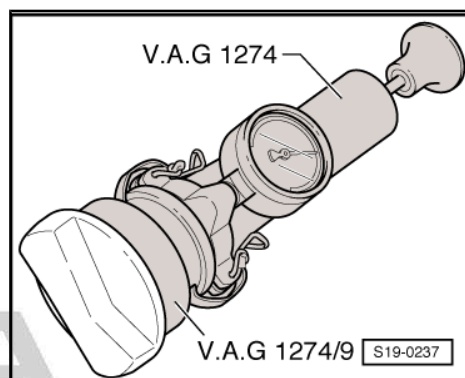
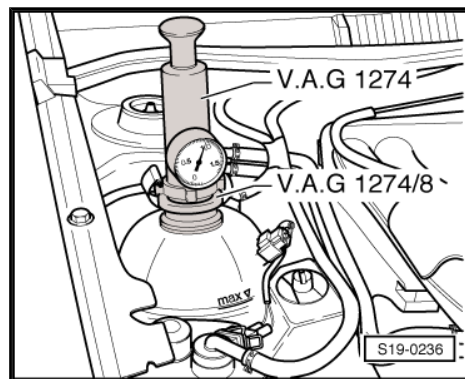
- Search position of the leak and repair fault.

#### Test the pressure valve in the cap

- Fit the cap of the expansion reservoir on the tester - V.A.G 1274- with adapter - V.A.G 1274/9- ,
- Generate a pressure for testing the pressure valve in the screw cap.
- The pressure valve should open at a pressure of 0.14...0.16 MPa (1.4...1.6 bar).

If the valve does not open in the prescribed pressure range:

- Renew cap.



### 4.4.2 Checking with the cooling system testing device - V.A.G 1274 B-

#### Special tools and workshop equipment required

- ◆ Cooling system testing device , e.g. -V.A.G 1274 B-
- ◆ Adapter , e.g. -V.A.G 1274/8-
- ◆ Adapter , e.g. -V.A.G 1274/9-

#### Test condition

- Engine must be warm.

#### Test sequence



#### WARNING

*When opening the expansion reservoir, out hot steam or hot coolant may escape.*

- ◆ *Wear safety goggles and safety clothing to avoid eye injuries and scalding.*
- ◆ *Cover the cap with a cloth and open carefully.*

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- Open the cap of the coolant expansion reservoir.
- Screw the adapter - V.A.G 1274/8- into the coolant expansion reservoir.
- Connect the connecting piece - V.A.G 1274 B/1- to the adapter - V.A.G 1274/8- .

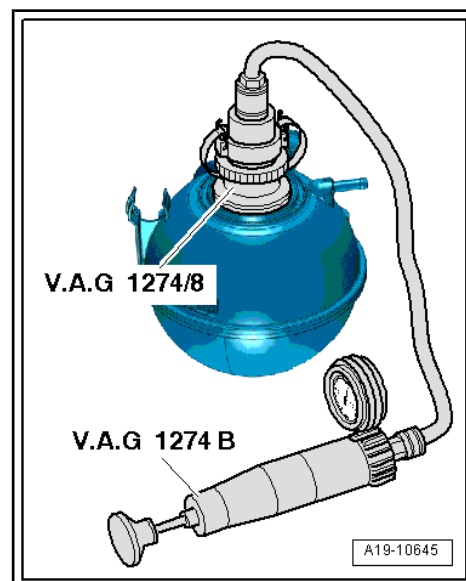
- Connect the connecting piece - V.A.G 1274 B/1- to the cooling system testing device - V.A.G 1274 B- via the supplied connecting hose.
- Using the hand pump of the testing device generate a pressure of approx. 0.1 MPa (1.0 bar).



# **WARNING**

## ***Risk of scalding!***

- ◆ ***Before the cooling system testing device - V.A.G 1274 B- is separated from the connecting hose or the connecting piece - V.A.G 1274 B/1- , the existing pressure must absolutely be released.***
- ◆ ***For this step, press the pressure relief valve on the cooling system testing device - V.A.G 1274 B- and hold it pressed until the pressure gauge indicates the value »0«.***



If pressure drops:

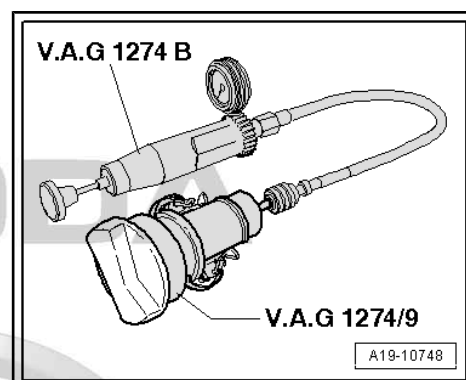
- Search position of the leak and repair fault.

## **Test the pressure valve in the cap**

- Screw the screw cap into the adapter - V.A.G 1274/9- .
- Connect the connecting piece - V.A.G 1274 B/1- to the adapter - V.A.G 1274/9- .
- Connect the connecting piece - V.A.G 1274 B/1- to the cooling system testing device - V.A.G 1274 B- via the supplied connecting hose.
- Generate a pressure for testing the pressure valve in the screw cap.
- The pressure valve should open at a pressure of 0.14...0.16 MPa (1.4...1.6 bar).

If the valve does not open in the prescribed pressure range:

- Renew cap.







## 20 – Fuel supply system

### 1 Measures in case of misfuelling

⇒ "1.1 Step 1: the engine was not started with incorrect fuel", page 195

⇒ "1.2 Step 2: engine started with incorrect fuel", page 195

⇒ "1.3 Step 3: metal swarfs are present in the fuel delivery unit and the fuel tank", page 196

⇒ "1.4 Step 4: no metal swarfs are present in the fuel delivery unit and the fuel tank", page 197

⇒ "1.5 Step 5: metal swarfs are present in the high pressure pump", page 197

⇒ "1.6 Step 6: no metal swarfs are present in the high pressure pump", page 198



#### Note

- ◆ *Fuel lines are secured with quick-release couplings.*
- ◆ *Fuel hoses must only be secured with spring strap clamps ⇒ ETKA - Electronic Catalogue of Original Parts .*
- ◆ *Use pliers for spring strap clips to fit the spring strap clips.*

Observe the safety instructions

⇒ "2.3 Safety precautions when working on fuel supply system", page 3 .

Observe rules for cleanliness

⇒ "2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4 .



#### Caution

***In case of misfuelling irreversible damage can occur to the high pressure components, in particular the high pressure pump, because of insufficient lubrication due to the diesel fuel or mechanical contaminations in the fuel or water.***

- ◆ ***Damage can be expected in the form of scoring and particle erosion.***
- ◆ ***Thus, free metal particles contaminate the fuel system as well as the injection system, whereby further damage can be expected especially to the fuel pressure regulating valve and in the injection units.***

Here are 2 examples which show the consequences of misfuelling when carrying out repair work.

#### Example 1

Misfuelling was noticed BEFORE starting the engine, the engine was NOT started.

#### Example 2

Misfuelling was noticed AFTER starting the engine. Contaminated or incorrect fuel was already drawn in and may be present in the high pressure parts.



## Note

*Collect the incorrect fuel which was drained from the fuel tank and the diesel fuel which was used for cleaning the fuel tank and dispose.*

### If the engine was started with incorrect fuel?

Yes ⇒ Step 2: engine was started with incorrect fuel  
⇒ ["1.2 Step 2: engine started with incorrect fuel", page 195](#) .

No ⇒ Step 1: the engine was not started with incorrect fuel  
⇒ ["1.1 Step 1: the engine was not started with incorrect fuel", page 195](#) .

## 1.1 Step 1: the engine was not started with incorrect fuel

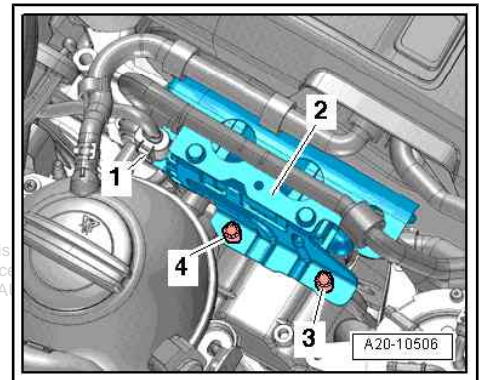


### Caution

***Do not switch on the ignition.***

***The engine must not be started.***

- Disconnect the plug -1- at the additional fuel pump - V393- in the engine compartment.
- Completely empty the fuel tank  
⇒ ["2.4 Extract fuel from the fuel tank", page 205](#) .
- Make a visual inspection to ensure that there is no contamination in the fuel tank, if necessary thoroughly clean the fuel tank.
- Fill the fuel tank with 5 ltr. of diesel fuel and empty it again  
⇒ ["2.4 Extract fuel from the fuel tank", page 205](#) .
- Completely fill up the fuel tank with diesel fuel.
- Replace the fuel filter  
⇒ ["2.3 Summary of components - fuel filter", page 204](#) .
- Fit the plug on the additional fuel pump - V393- in the engine compartment.
- Perform a test drive.



End

## 1.2 Step 2: engine started with incorrect fuel

- Completely empty the fuel tank  
⇒ ["2.4 Extract fuel from the fuel tank", page 205](#) .
- Remove fuel delivery unit:
  - ◆ Octavia II  
⇒ ["2.5 Removing and installing fuel delivery unit Octavia II", page 207](#) .
  - ◆ Superb II, Yeti  
⇒ ["2.6 Removing and installing fuel delivery unit Superb II, Yeti", page 209](#) .
- Carry out a visual inspection to assure that the empty fuel tank as well as the emptied fuel delivery unit do not contain any metal abrasion or swarf.

## In the event that metal swarfs are present?

Yes ⇒ Step 3: metal swarfs are present in the fuel delivery unit and the fuel tank

⇒ ["1.3 Step 3: metal swarfs are present in the fuel delivery unit and the fuel tank", page 196](#) .

No ⇒ Step 4: no metal swarfs are present in the fuel delivery unit and the fuel tank

⇒ ["1.4 Step 4: no metal swarfs are present in the fuel delivery unit and the fuel tank", page 197](#) .

### 1.3 Step 3: metal swarfs are present in the fuel delivery unit and the fuel tank

- Blow out the fuel low-pressure lines between the engine compartment and the fuel tank with compressed air.
- Carefully wipe the bottom of the fuel tank with a non-fluffy cloth.

- Install fuel delivery unit:

#### ♦ Octavia II

⇒ ["2.5 Removing and installing fuel delivery unit Octavia II", page 207](#) .

#### ♦ Superb II, Yeti

⇒ ["2.6 Removing and installing fuel delivery unit Superb II, Yeti", page 209](#) .

- Fill the fuel tank with 5 ltr. of diesel fuel and empty it again

⇒ ["2.4 Extract fuel from the fuel tank", page 205](#) .

- Replace the fuel filter

⇒ ["2.3 Summary of components - fuel filter", page 204](#) .

- Replace the following high pressure components:

#### ♦ High pressure pump

⇒ ["2.8 Removing and installing the high pressure pump", page 287](#) .

#### ♦ High pressure lines

⇒ ["2.1 Assembly overview - fuel system", page 271](#) .

#### ♦ Fuel high pressure reservoir

⇒ ["2.1 Assembly overview - fuel system", page 271](#) .

#### ♦ Fuel pressure regulating valve - N276-

⇒ ["2.6 Replace fuel pressure regulating valve N276", page 284](#) .

#### ♦ Fuel pressure sender - G247-

⇒ ["2.7 Removing and installing fuel pressure sender G247", page 285](#) .

#### ♦ Injection units

⇒ ["2.3 Removing and installing the injection units", page 276](#) .

- ♦ Fuel return-flow lines ⇒ ["1.2 System overview", page 268](#) .

#### ♦ Additional fuel pump - V393- in engine compartment

⇒ ["2.14 Removing and installing additional fuel pump V393", page 230](#) .

- Completely fill up the fuel tank with diesel fuel.

- Filling and bleeding the high pressure pump and the fuel system

⇒ ["2.9 Fill the high pressure pump with fuel and discharge the fuel system", page 290](#) .

- Perform a test drive.

End

## 1.4 Step 4: no metal swarfs are present in the fuel delivery unit and the fuel tank

- Fill the fuel tank with 5 ltr. of diesel fuel and empty it again  
⇒ [“2.4 Extract fuel from the fuel tank”, page 205](#) .
- Replace high pressure pump  
⇒ [“2.8 Removing and installing the high pressure pump”, page 287](#) .



### Caution

*The following work step may only be carried out at the old high pressure pump that was removed in the above item, which must be disposed of after the internal check is carried out.*

- Unscrew screws -arrows- and remove the fuel dosage valve -A- from the high pressure pump.
- Carry out a visual inspection to assure that the fuel dosage valve as well as the high pressure pump do not contain any metal abrasion or swarf.

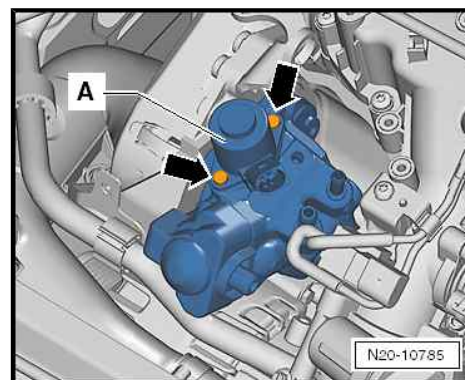
### In the event that metal swarfs are present?

Yes ⇒ Step 5: metal swarfs are present in the high pressure pump

⇒ [“1.5 Step 5: metal swarfs are present in the high pressure pump”, page 197](#) .

No ⇒ Step 6: no metal swarfs are present in the high pressure pump

⇒ [“1.6 Step 6: no metal swarfs are present in the high pressure pump”, page 198](#) .



## 1.5 Step 5: metal swarfs are present in the high pressure pump

- Replace the fuel filter  
⇒ [“2.3 Summary of components - fuel filter”, page 204](#) .
- Replace the following high pressure components:
  - ◆ High pressure lines  
⇒ [“2.1 Assembly overview - fuel system”, page 271](#) .
  - ◆ Fuel high pressure reservoir  
⇒ [“2.1 Assembly overview - fuel system”, page 271](#) .
  - ◆ Fuel pressure regulating valve - N276-  
⇒ [“2.6 Replace fuel pressure regulating valve N276”, page 284](#) .
  - ◆ Fuel pressure sender - G247-  
⇒ [“2.7 Removing and installing fuel pressure sender G247”, page 285](#) .
  - ◆ Injection units  
⇒ [“2.3 Removing and installing the injection units”, page 276](#) .
  - ◆ Fuel return-flow lines ⇒ [“1.2 System overview”, page 268](#) .
  - ◆ Additional fuel pump - V393- in engine compartment  
⇒ [“2.14 Removing and installing additional fuel pump V393”, page 230](#) .
- Completely fill up the fuel tank with diesel fuel.





- Filling and bleeding the high pressure pump and the fuel system  
⇒ [“2.9 Fill the high pressure pump with fuel and discharge the fuel system”, page 290](#) .
- Perform a test drive.

End

## 1.6 Step 6: no metal swarfs are present in the high pressure pump

- Replace the fuel filter  
⇒ [“2.3 Summary of components - fuel filter”, page 204](#) .
- Completely fill up the fuel tank with diesel fuel.
- Filling and bleeding the high pressure pump and the fuel system  
⇒ [“2.9 Fill the high pressure pump with fuel and discharge the fuel system”, page 290](#) .
- Perform a test drive.

End

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## 2 Removing and installing parts of the fuel supply system

⇒ [“2.1 Summary of components - Fuel tank with attached parts Octavia II”, page 199](#)

⇒ [“2.2 Summary of components - Fuel tank with attached parts Superb II, Yeti”, page 202](#)

⇒ [“2.3 Summary of components - fuel filter”, page 204](#)

⇒ [“2.4 Extract fuel from the fuel tank”, page 205](#)

⇒ [“2.5 Removing and installing fuel delivery unit Octavia II”, page 207](#)

⇒ [“2.6 Removing and installing fuel delivery unit Superb II, Yeti”, page 209](#)

⇒ [“2.7 Removing and installing the fuel gauge sender G ”, page 212](#)

⇒ [“2.8 Removing and installing fuel gauge sender 2 G169 with suction jet pump Superb II, Yeti”, page 213](#)

⇒ [“2.9 Separating push-on couplings”, page 216](#)

⇒ [“2.10 Removing and installing the fuel tank Octavia II”, page 219](#)

⇒ [“2.11 Removing and installing the fuel tank Superb II, Yeti”, page 221](#)

⇒ [“2.12 inspecting fuel pump”, page 223](#)

⇒ [“2.13 Summary of components - Additional pressure pump V393 ”, page 229](#)

⇒ [“2.14 Removing and installing additional fuel pump V393 ”, page 230](#)

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### Note

- ◆ *Fuel lines are secured with quick-release couplings.*
- ◆ *Fuel hoses at the engine must only be secured with spring-type clamps ⇒ ETKA - Electronic catalogue of original parts .*
- ◆ *Use pliers for spring strap clips to fit the spring strap clips.*

Observe the safety instructions

⇒ [“2.3 Safety precautions when working on fuel supply system”, page 3 .](#)

Observe rules for cleanliness

⇒ [“2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system”, page 4 .](#)

### 2.1 Summary of components - Fuel tank with attached parts Octavia II



### 1 - Mounting part

### 2 - Screw cap

- ☐ replace the O-ring if it is damaged

### 3 - Earth connection

### 4 - Screw

- ☐ 10 Nm

### 5 - Guide

### 6 - Screw

- ☐ Replace after removal
- ☐ 25 Nm

### 7 - Fuel tank

- ☐ when removing, support using the engine/gear-box jack , e.g. -V.A.G 1383 A-
- ☐ Removing and installing  
⇒ ["2.10 Removing and installing the fuel tank Octavia II", page 219](#)

### 8 - Circlip

- ☐ 2 Nm

### 9 - Unbolt bracket for exhaust pipe

### 10 - Tensioning strap

- ☐ Check fitting position

### 11 - Heat shield

### 12 - Sealing ring

- ☐ Replace if damaged.
- ☐ to be inserted dry into the opening of the fuel tank
- ☐ must be moistened on the inside with fuel before assembly of the fuel delivery unit

### 13 - Fuel pump

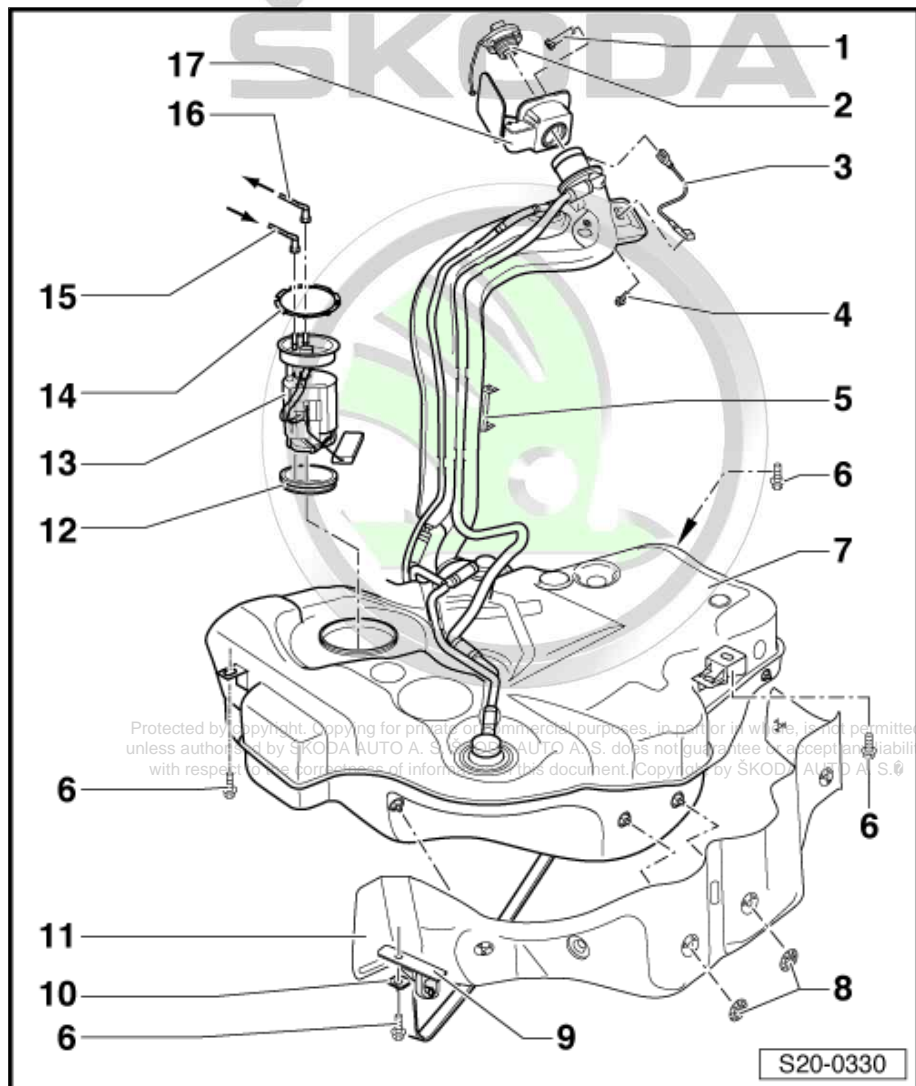
- ☐ with fuel gauge sender - G-
- ☐ Removing and installing ⇒ ["2.5 Removing and installing fuel delivery unit Octavia II", page 207](#)
- ☐ Note correct installation position on the fuel tank ⇒ [page 201](#)
- ☐ inspecting fuel pump ⇒ ["2.12 inspecting fuel pump", page 223](#)
- ☐ Clean strainer if dirty
- ☐ Removing and installing the fuel gauge sender - G-  
⇒ ["2.7 Removing and installing the fuel gauge sender G ", page 212](#)

### 14 - Lock ring

- ☐ use wrench - T30101 (3087)- for removing and installing
- ☐ check correct fitting
- ☐ 110 Nm

### 15 - Return-flow line

- ☐ from fuel filter
- ☐ clipped in place on fuel tank
- ☐ check correct fitting
- ☐ blue



## 16 - Feed line

- ☐ to fuel filter
- ☐ clipped in place on fuel tank
- ☐ check correct fitting
- ☐ black

## 17 - Fuel tank lid unit

- ☐ with rubber bowl
- ☐ Removing and installing ⇒ Body Work; Rep. gr. 55

### Fitting location of the fuel delivery unit

The marking -3- on the flange of the fuel delivery unit points against the direction of travel.

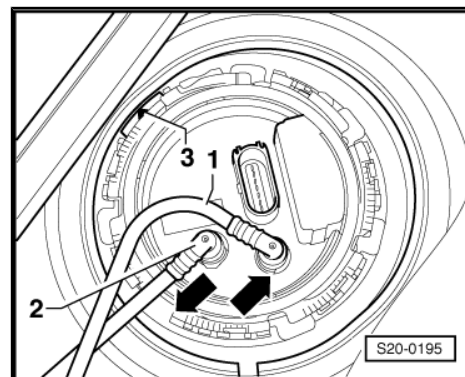


#### Note

*The fuel delivery unit can only be installed in this position.*

Blue return-flow line -1-.

Black feed line -2-.



#### Note

*After installing the fuel delivery unit, check whether the feed line and the return-flow line are still clipped in place on the fuel tank.*



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## 2.2 Summary of components - Fuel tank with attached parts Superb II, Yeti

### 1 - Fuel tank lid unit

- ☐ with rubber bowl
- ☐ Removing and installing  
⇒ Body Work; Rep. gr.  
55

### 2 - Screw cap

### 3 - Mounting part

### 4 - Earth connection

- ☐ check for firm seating

### 5 - Screw

- ☐ 10 Nm

### 6 - Suction spray pump

- ☐ connected to the fuel gauge sender 2 - G169-
- ☐ Removing and installing  
⇒ [page 213](#)

### 7 - Lock ring

- ☐ use wrench -T30101 (3087)- for removing and installing
- ☐ check for firm seating
- ☐ 110 Nm

### 8 - Fuel gauge transmitter 2 - G169-

- ☐ Note correct installation position on the fuel tank  
⇒ [page 203](#)
- ☐ Removing and installing  
⇒ [page 213](#)

### 9 - Sealing ring

- ☐ Replace if damaged.
- ☐ to be inserted dry into the opening of the fuel tank
- ☐ only moisten with fuel from the inside for installing the flange

### 10 - Fuel tank

- ☐ when removing, support with the engine/gearbox jack e.g. -V.A.G 1383 A-
- ☐ Removing and installing ⇒ [page 221](#)

### 11 - Tensioning strap

- ☐ Check fitting position

### 12 - Screw

- ☐ Replace after removal
- ☐ 25 Nm

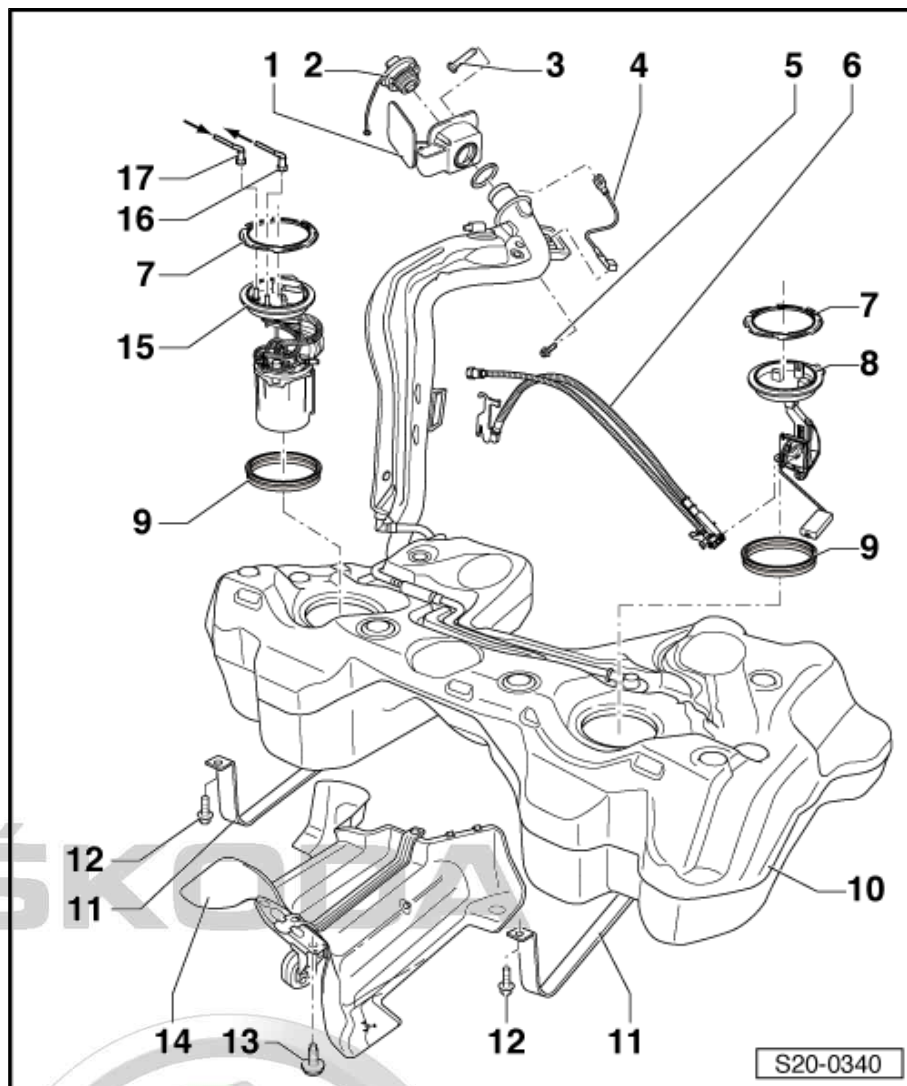
### 13 - Screw

- ☐ 25 Nm

### 14 - Heat shield

### 15 - Fuel pump

- ☐ with fuel gauge sender - G-
- ☐ Removing and installing ⇒ [page 209](#)



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- ☐ Note correct installation position on the fuel tank ➔ [page 203](#)
- ☐ inspecting fuel pump ➔ [page 223](#)
- ☐ Clean strainer if dirty
- ☐ Removing and installing the fuel gauge sender - G- ➔ [page 212](#)

#### 16 - Feed line

- ☐ to fuel filter
- ☐ clipped in place on fuel tank
- ☐ check for firm seating
- ☐ black

#### 17 - Return-flow line

- ☐ clipped in place on fuel tank
- ☐ check for firm seating
- ☐ blue (blue marking)

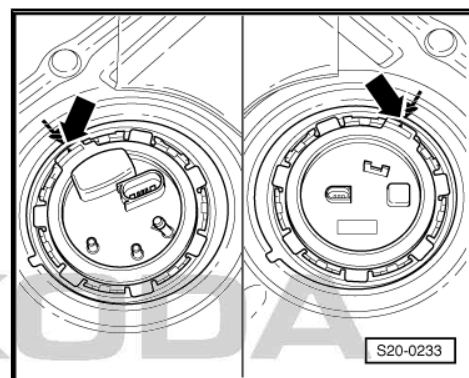
#### Fitting position of the flange of the fuel delivery unit (with fuel gauge sender - G- ) and the flange with fuel gauge sender 2 - G169-

The markings on the flanges must be aligned with markings on the fuel tank -arrows-.



#### Note

- ◆ *The markings on the fuel tank are hardly visible.*
- ◆ *After installing the fuel delivery unit, check whether the feed line and the return-flow line are correctly clipped in place on the fuel tank.*



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## 2.3 Summary of components - fuel filter



### Note

Before disconnecting the fuel hoses, mark assignment to the supports.

#### 1 - Return-flow hose

- ☐ to fuel tank
- ☐ blue marking and blue inscription
- ☐ is connected on the blue line on the separation point in the engine compartment on the right

#### 2 - Intake hose

- ☐ from fuel tank
- ☐ white marking and white inscription
- ☐ is connected on the black line on the separation point in the engine compartment on the right

#### 3 - Fuel filter - top part

- ☐ raise at the assembly groove using the offset screwdriver - VAS 6543- :

◆ ⇒ Maintenance ; Booklet Octavia II

◆ ⇒ Maintenance ; Booklet Superb II

◆ ⇒ Maintenance ; Booklet Yeti

#### 4 - Screw

- ☐ 5 Nm

#### 5 - Return-flow hose

- ☐ of engine
- ☐ blue marking and blue inscription

#### 6 - Intake hose

- ☐ to additional fuel pump
- ☐ white marking and white inscription

#### 7 - Sealing ring

- ☐ Replace after removal

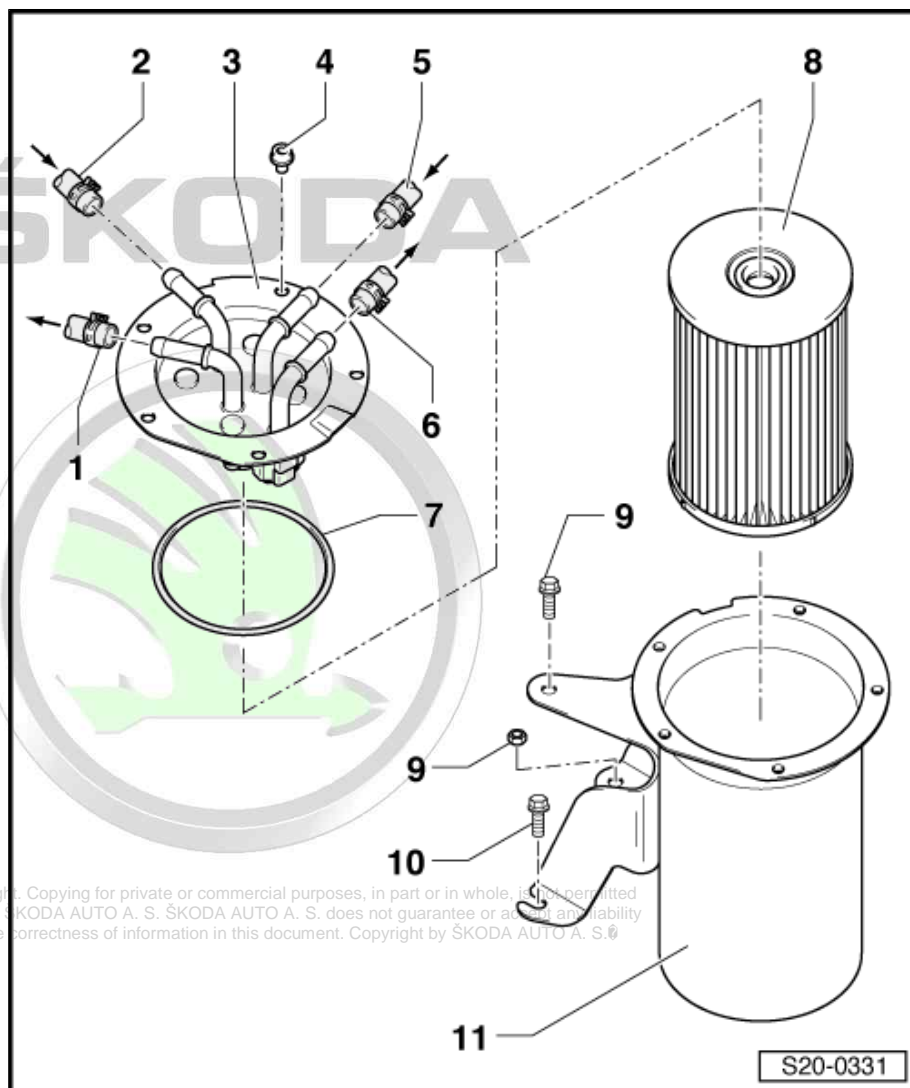
#### 8 - Fuel filter element

- ☐ Pay attention to change intervals:

◆ ⇒ Maintenance ; Booklet Octavia II

◆ ⇒ Maintenance ; Booklet Superb II

◆ ⇒ Maintenance ; Booklet Yeti





**Caution**

*Risk of damage to the high pressure pump from running dry.*

*When replacing the fuel filter insert, the high pressure pump must be filled with fuel and the fuel system must be discharged before starting the engine for the first time  
⇒ "2.9 Fill the high pressure pump with fuel and discharge the fuel system", page 290 .*

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**9 - Screw and nut**

- ☐ 8 Nm

**10 - Screw**

- ☐ to remove fuel filter only slacken screw
- ☐ 8 Nm

**11 - Fuel filter - bottom part with integrated bracket**

## 2.4 Extract fuel from the fuel tank

### Special tools and workshop equipment required

- ◆ Hose adapter , e. g. -V.A.G 1318/16-
- ◆ Adapter , e.g. -V.A.G 1318/17-
- ◆ Auxiliary measuring set, , e. g. -V.A.G 1594 C-
- ◆ Battery
- ◆ Fuel tank



**Note**

*If there are functional problems of the fuel delivery unit suction off fuel with fuel extraction device , e.g. -VAS 5190- .*

### Work procedure



**Note**

- ◆ *Safety precautions when working on the fuel supply system  
⇒ "2.3 Safety precautions when working on fuel supply system", page 3 .*
- ◆ *Observe rules for cleanliness  
⇒ "2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4 .*
- Switch off ignition and pull out ignition key.

### For the vehicles Octavia II, Superb II

- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .





### For the vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72 .
- Remove floor covering under the rear seats.

### For all vehicles

- Unclip retaining catches -arrows- of cover for the fuel delivery unit and remove cover.



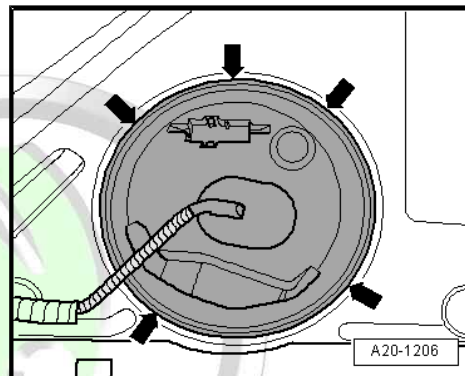
#### Note

For vehicles with auxiliary heating, the plug connection for the dosing pump - V54- must also be disconnected.



#### WARNING

**Fuel feed line is pressurised. Wear safety goggles and safety clothing, in order to avoid injuries and skin contact with fuel. Place cleaning cloths around the connection point before detaching cable connections. Reduce pressure by carefully removing the wiring.**

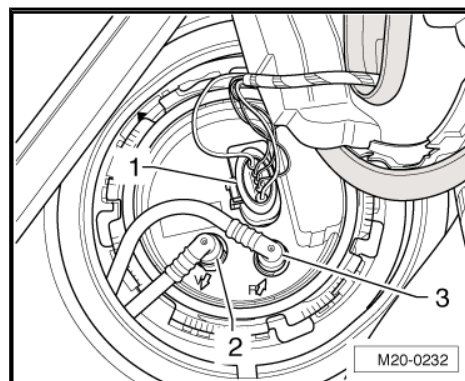


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Press in the securing ring in order to unlock the fuel line. Unlock the quick coupling and disconnect  
⇒ [“2.9 Separating push-on couplings”, page 216](#) .

- Disconnect connector -1- and black feed line -2-. Unlock the quick coupling and disconnect  
⇒ [“2.9 Separating push-on couplings”, page 216](#) .

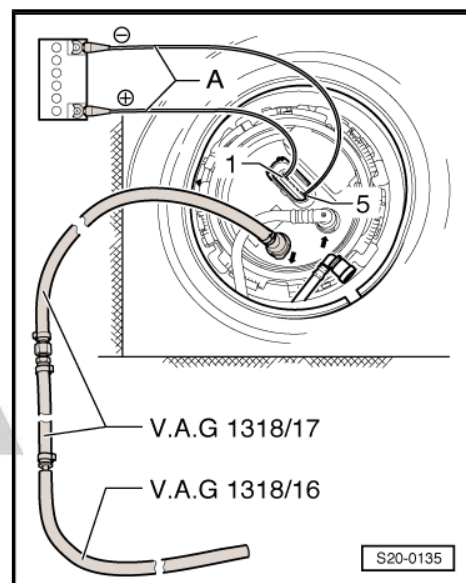


- Connect the adapter set - V.A.G 1318/17- and the hose adapter - V.A.G 1318/16- and fit the resulting “drain pipe” onto the feed support of the fuel pump.
- Hold the “drain pipe” in a suitable catch pan for fuel.
- Connect the battery and the contacts of the fuel pump with adapter cables -A- from the adapter cable set as follows:  
Battery positive terminal (+) to contact -1- of the fuel pump.  
Battery negative terminal (-) to contact -5- of fuel pump.

The fuel pump runs and suctions off fuel.

**⚠ WARNING**

*In order to prevent an overflow of fuel in case of a too small fuel tank, the fuel pump must not run unattended.*



## 2.5 Removing and installing fuel delivery unit Octavia II

Special tools and workshop equipment required

- ◆ Wrench for the lock ring - T30101 (3087)-
- ◆ Protective gloves

### Removing

- The fuel tank must not be more than  $\frac{3}{4}$  full.

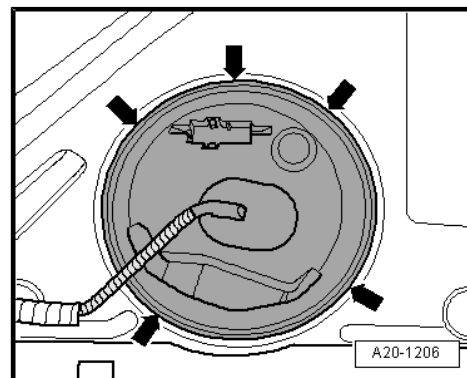
### **i** Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ “2.3 Safety precautions when working on fuel supply system”, page 3
- ◆ *Observe rules for cleanliness*  
⇒ “2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system”, page 4.

- Switch off ignition and pull out ignition key.
- If necessary drain the fuel tank  
⇒ “2.4 Extract fuel from the fuel tank”, page 205.
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72.
- Unclip retaining catches -arrows- of cover for the fuel delivery unit and remove cover.

### **i** Note

*For vehicles with auxiliary heating, the plug connection for the dosing pump - V54- must be disconnected additionally.*



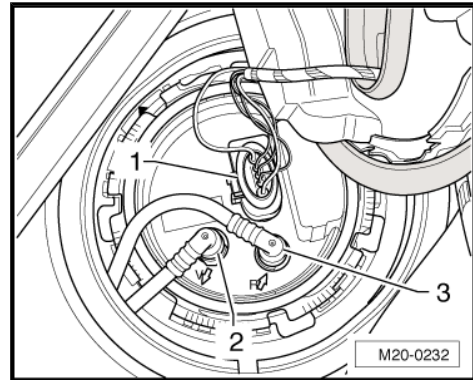


- Disconnect plug -1-, black feed line -2- and blue return line -3-. Unlock the quick coupling and disconnect  
⇒ ["2.9 Separating push-on couplings", page 216](#) .



**Note**

- ◆ Press in the securing ring in order to unlock the line.
- ◆ For vehicles with auxiliary heating the suction line for the dosing pump - V54- must be pulled out additionally (open lower clamp).

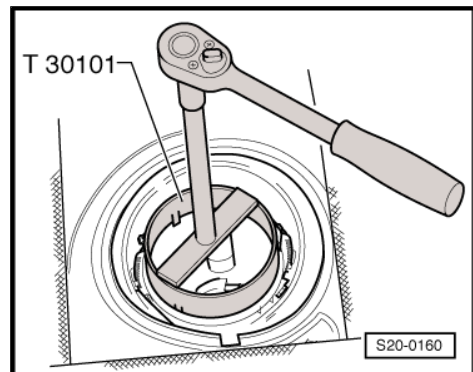


- Open lock ring with the wrench - T30101 (3087)- .



**Note**

- ◆ You must wear protective gloves for removing the fuel delivery unit.
- ◆ When installing, ensure that the float arm of the sender for fuel gauge - G- is not bent.
- Pull the fuel delivery unit and the sealing ring out of the opening of the fuel tank.



**Note**

*You must empty the old delivery unit before disposing of it if you wish to replace the fuel delivery unit.*

**Installing**

- The installation of the fuel delivery unit occurs in the reverse order. However, pay attention to the following:

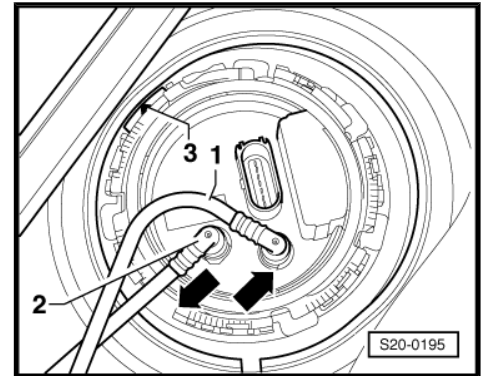
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#### Note

- ◆ Insert dry sealing ring into the opening of the fuel tank.
- ◆ The sealing ring must only be moistened on the inside with fuel before assembly of the fuel delivery unit.
- ◆ When installing, do not bend the float arm of the fuel gauge sender - G- .
- ◆ Fitting position of the fuel delivery unit: the marking -3- on the flange of the fuel delivery unit points against the direction of travel. The fuel delivery unit can only be installed in this position.
- ◆ Do not interchange feed line and return-flow line.
- ◆ Tighten lock ring to the specified tightening torque.
- ◆ Make sure the line connections fit tightly.
- ◆ After installing the fuel delivery unit, check whether the feed line and the return-flow line are clipped in place on the fuel tank.



#### Tightening torques

- ◆ Lock ring  
⇒ ["2.1 Summary of components - Fuel tank with attached parts Octavia II", page 199](#)

## 2.6 Removing and installing fuel delivery unit Superb II, Yeti

#### Special tools and workshop equipment required

- ◆ Wrench for the lock ring - T30101 (3087)-
- ◆ Protective gloves

#### Removing

- The fuel tank must not be more than 1/4 full.



#### Note

- ◆ **Safety precautions when working on the fuel supply system**  
⇒ ["2.3 Safety precautions when working on fuel supply system", page 3](#)
- ◆ **Observe rules for cleanliness**  
⇒ ["2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4](#) .

- Switch off ignition and pull out ignition key.
- If necessary drain the fuel tank  
⇒ ["2.4 Extract fuel from the fuel tank", page 205](#) .

#### For the vehicles Superb II

- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

#### For the vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72 .
- Remove floor covering under the rear seats.





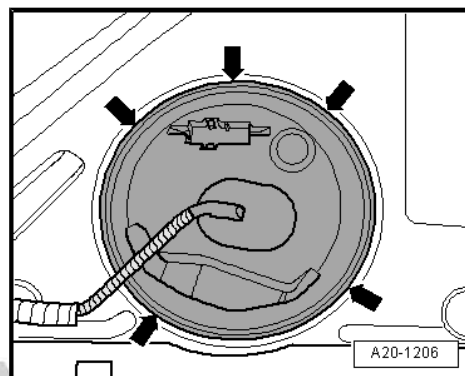
## For all vehicles

- Unclip retaining catches -arrows- of cover for the fuel delivery unit and remove cover.



### Note

*For vehicles with auxiliary heating, the plug connection for the dosing pump - V54- must also be disconnected.*

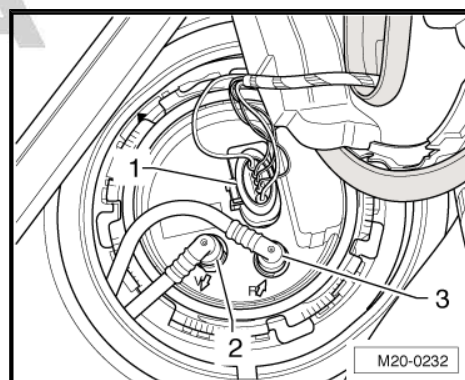


- Disconnect plug -1-, black feed line -2- and blue return line -3-. Unlock the quick coupling and disconnect  
⇒ ["2.9 Separating push-on couplings", page 216](#) .

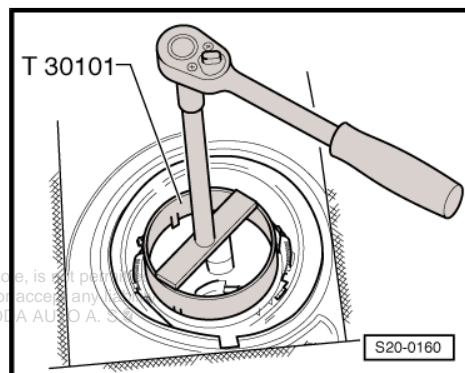


### Note

- ♦ Press in the securing ring in order to unlock the line.
- ♦ For vehicles with auxiliary heating the suction line for the dosing pump - V54- must be pulled out additionally (open lower clamp).



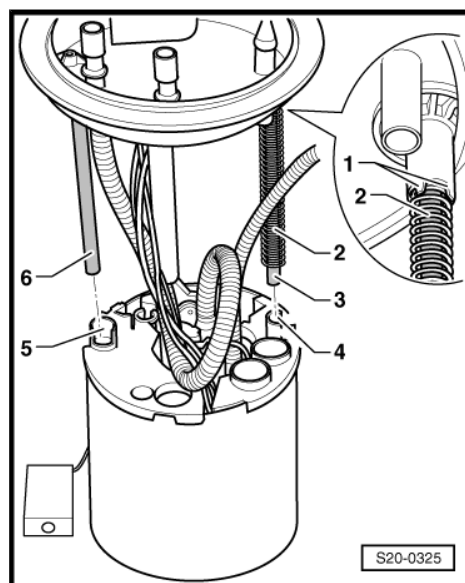
- Open lock ring with the wrench - T30101 (3087)- .



- Slightly raise the closing flange and check if the spring -2- is still fastened on the flange -1-.

If the spring -2- is loose on the guide pipe -3-, hold it with your fingers while removing the closing flange.

- Pull closing flange and gasket ring for fuel pump out of the opening of the fuel tank and place to the side with the connected lines.



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- Through the opening of the fuel tank, disconnect the fuel line -1- to the vacuum pump by pressing the release button.
- Disconnect the fuel delivery line -2- from the fuel delivery unit.



#### Note

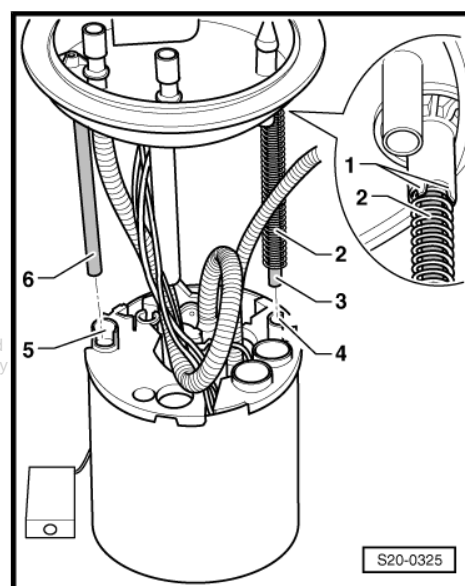
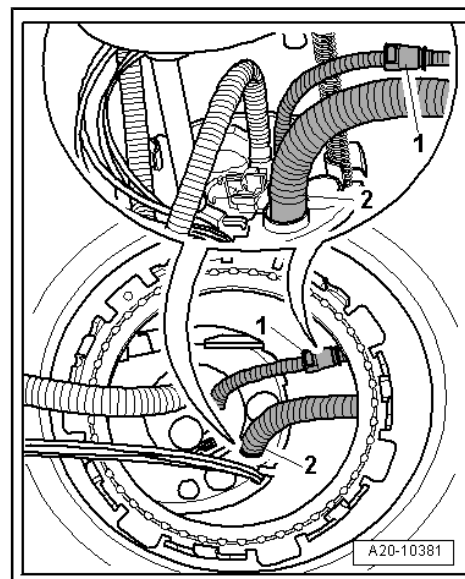
- ◆ *You must wear protective gloves for removing the fuel delivery unit.*
- ◆ *Remove fuel pump from the fuel tank so that the electric cables and fuel hoses are not damaged and the float arm of the fuel gauge sender - G- is not bent.*
- ◆ *You must empty the old delivery unit before disposing of it if you wish to replace the fuel delivery unit.*

- Pull the fuel delivery unit out of the opening of the fuel tank.

#### Installing

The installation of the fuel delivery unit occurs in the reverse order. Pay attention to the following:

- Insert the fuel delivery unit into the fuel tank with the closing flange placed to the side. Do not bend the float arm of the fuel gauge sender unit - G- while doing so.
- Install the fuel delivery unit and the fuel line.
- Insert the dry sealing ring for the flange into the opening of the fuel tank and moisten only from the inside with fuel for installing the closing flange.
- The spring -2- must be fastened to the retaining lugs -1- of the closing flange.
- First of all guide the guide pipe -3- into the guide bore -4-.
- Then lower the closing flange in such a way that the guide pipe -6- locks into the guide bore -5-.



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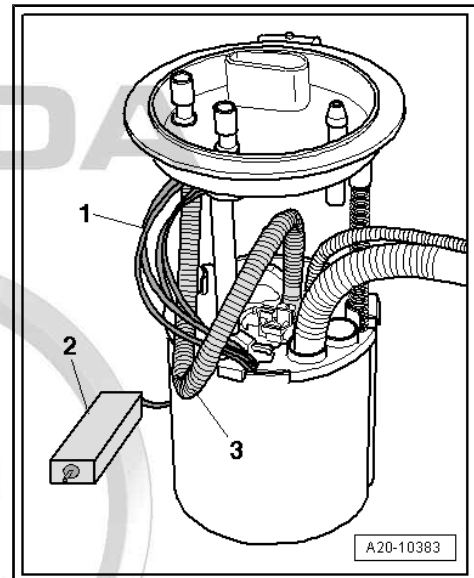


## Note

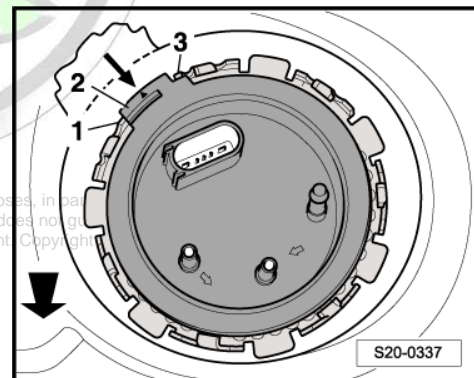
*Pay attention that the electrical cables -1- and the fuel feed line -3- are routed according to the illustration and the float arm -2- is not blocked.*

- Press the closing flange down and bring it into the installation position.

Further information:



- ♦ Fitting position of the fuel delivery unit: the stud -2- on the closing flange must be located between the tabs -1- and -3-. The thick -arrow- points in the direction of travel.
- ♦ Tighten lock ring to the specified tightening torque.
- ♦ Do not interchange feed line and return-flow line.
- ♦ Make sure the fuel lines fit tightly.
- ♦ After installing the fuel delivery unit, check whether the feed line and the return-flow line are clipped in place on the fuel tank.



## Tightening torques

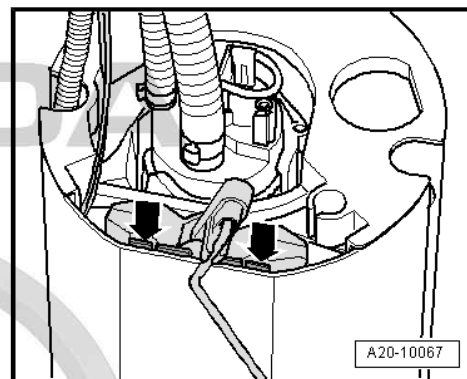
- ♦ Lock ring  
⇒ ["2.2 Summary of components - Fuel tank with attached parts Superb II, Yeti", page 202](#)

## 2.7 Removing and installing the fuel gauge sender - G-

### Removing

- Remove fuel delivery unit:
- ♦ Octavia II  
⇒ ["2.5 Removing and installing fuel delivery unit Octavia II", page 207](#) .
- ♦ Superb II, Yeti  
⇒ ["2.6 Removing and installing fuel delivery unit Superb II, Yeti", page 209](#) .

- Unlock the securing tabs -arrows- using a screwdriver and pull the fuel gauge sender - G- up and out.



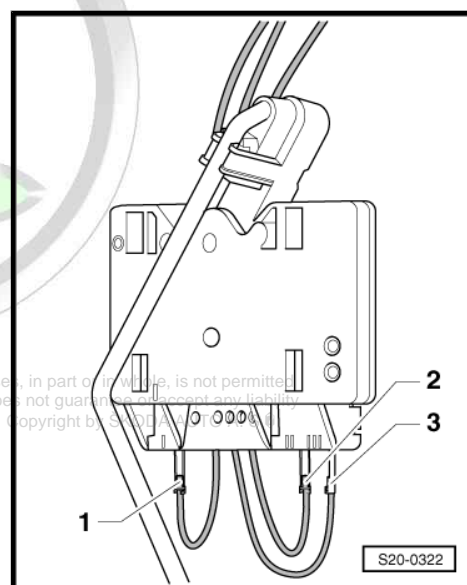
- Unlatch and disconnect the plug connection of the lines -1- (brown), -2- (blue) and -3- (black).

#### Installing

- Connect the wiring and check correct installation of the plug.
- Insert the fuel gauge sender - G- into the guides on the fuel delivery unit and press down until it engages.
- Install fuel delivery unit:

- ◆ Octavia II  
⇒ ["2.5 Removing and installing fuel delivery unit Octavia II", page 207](#) .

- ◆ Superb II, Yeti  
⇒ ["2.6 Removing and installing fuel delivery unit Superb II, Yeti", page 209](#) .



## 2.8 Removing and installing fuel gauge sender 2 - G169- with suction jet pump Superb II, Yeti

### Special tools and workshop equipment required

- ◆ Socket - T30101 (3087)-

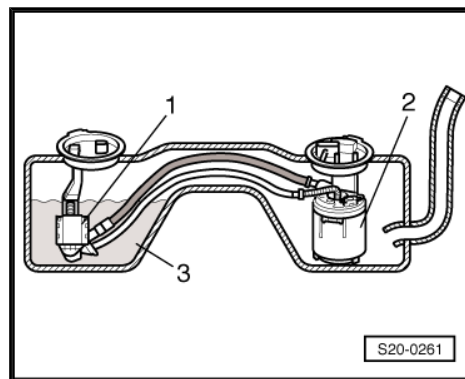
### Condition

- The fuel tank must not be more than  $\frac{1}{2}$  full.



## Note

- ◆ The fuel tank is subdivided in a left and a right chamber. In order to pump the fuel out of the left chamber -3- of the fuel tank into the right chamber of the fuel delivery unit -2-, a suction spray pump -1- is required.
- ◆ The version of the fuel tank requires that the fuel is pumped with a suction spray pump out of the area of the fuel gauge sender 2 - G169- to the fuel delivery unit.
- ◆ A check of the suction spray pump only has to be carried out, if the engine stops because of fuel shortage, although the fuel gauge still indicates a fuel tank which is still at least  $\frac{1}{4}$  full.
- ◆ If necessary, extract fuel from the fuel tank  
⇒ ["2.4 Extract fuel from the fuel tank", page 205](#) .
- ◆ Safety precautions when working on the fuel supply system  
⇒ ["2.3 Safety precautions when working on fuel supply system", page 3](#) .
- ◆ Observe cleanliness requirements when working on the fuel system  
⇒ ["2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4](#) .
- ◆ Check that the fuel lines on the suction spray pump are fitted on firmly and not damaged and that the suction spray pump is not soiled.
- ◆ Make sure that the float arm of the fuel gauge transmitter 2 - G169- is not bent.



## Removing

- Switch off ignition and pull out ignition key.

### For the vehicles Superb II

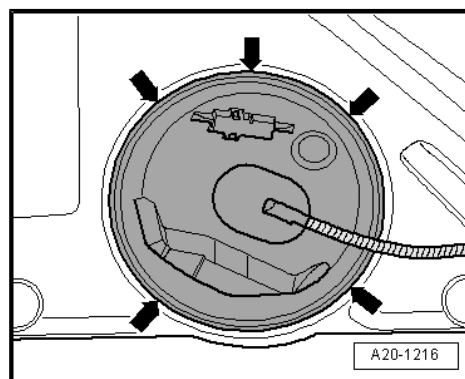
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

### For the vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72 .
- Remove floor covering under the rear seats.

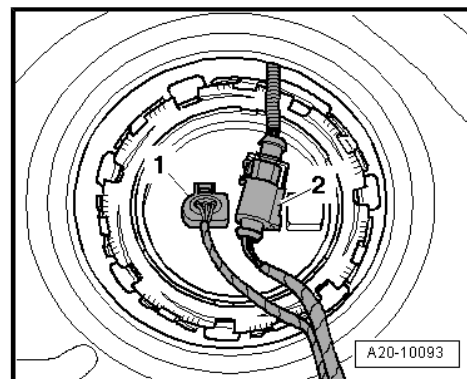
### For all vehicles

- Remove fuel delivery unit  
⇒ ["2.6 Removing and installing fuel delivery unit Superb II, Yeti", page 209](#) .
- Remove cover left -arrows- of the fuel gauge sender 2 - G169- .





- Separate electrical plug connection -1-.
- Take plug connection -2- out of the holder, disconnect and expose electric cable.



- Unlock lock ring at flange with wrench -T30101 (3087)- .
- Pull fuel gauge sender 2 - G169- together with suction jet pump out of the fuel tank opening.
- Take out sealing ring.

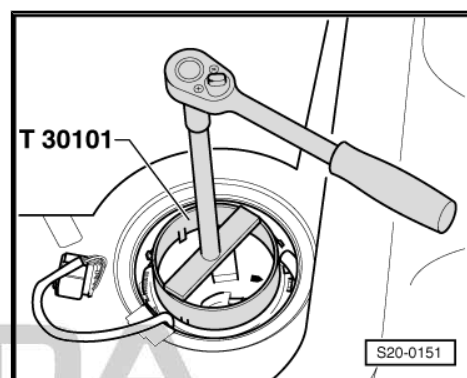
#### Installing

- Installation is carried out in the reverse order. Pay attention to the following:



#### Caution

*When installing do not bend the float arm of the fuel gauge transmitter 2 - G169- .*



- Insert new dry gasket ring into the opening of the fuel tank and only then moisten the inside with fuel.
- Insert fuel gauge sender 2 - G169- into the fuel tank.
- Connect fuel lines of the suction jet pump to fuel delivery unit.
- Pay attention to the fitting location of the fuel gauge sender 2 - G169- .
- Check correct positioning of sealing ring.
- Tighten lock ring with wrench for union nut - T30101- .
- Mount plug.
- Install cover.
- Install fuel delivery unit  
⇒ ["2.6 Removing and installing fuel delivery unit Superb II, Yeti", page 209](#) .

#### For the vehicles Superb II

- Install rear seat bench ⇒ [Body Work; Rep. gr. 72](#) .

#### For the vehicles Yeti

- Insert the floor covering under the rear seat bench.
- Install rear seat bench with brackets ⇒ [Body Work; Rep. gr. 72](#) .

#### Tightening torques

- ◆ Lock ring  
⇒ ["2.2 Summary of components - Fuel tank with attached parts Superb II, Yeti", page 202](#)



## 2.9 Separating push-on couplings

### Special tools and workshop equipment required

- ♦ Lever - T10468-

### Assign quick couplings



#### Note

*The quick couplings of fuel, vacuum and ventilation lines are colour marked. Either the colour point at the quick coupling or the release button has the corresponding colour.*

Push-on coupling	Colour coding at the quick coupling
fuel feed line	Black
Fuel return-flow line	Blue
Breather	White, beige
Vacuum	Green

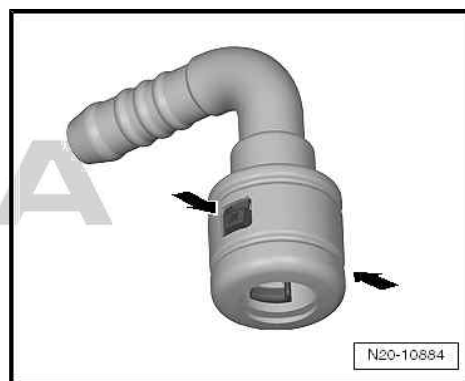


#### WARNING

*Fuel feed line is pressurised. Wear safety goggles and safety clothing, in order to avoid injuries and skin contact with fuel. Place cleaning cloths around the connection point before detaching hose connections. Reduce pressure by carefully disconnecting push-fit coupling.*

#### Version 1

Quick coupling with release buttons -arrows- on right and left.



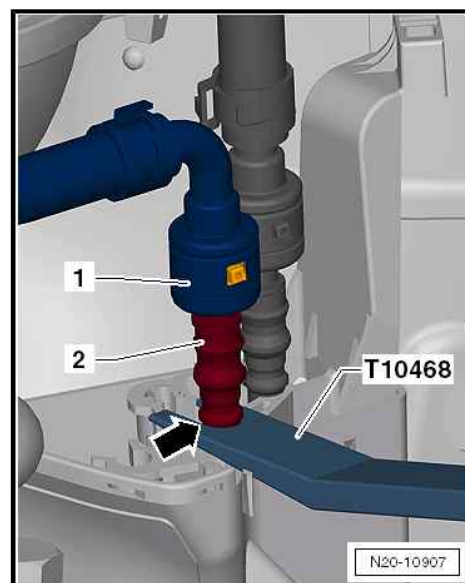
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Separation point -1- in the engine compartment must be supported.

- Insert the lever - T10468- between the heat shield and the stop -arrow- of the fuel line -2- and hold.

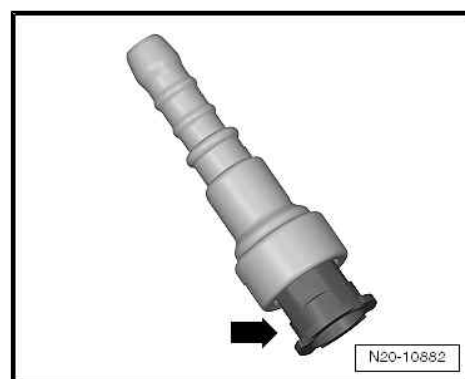
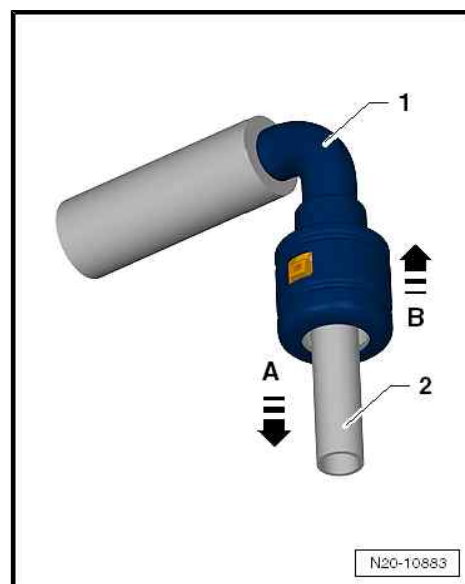
Continued for all separation points.



- Press the quick coupling -1- in direction of arrow -A-.
- Press the release buttons and remove the quick coupling -1- from the fuel line -2- in direction of the arrow -B-.

Pay attention to the assignment of the colours when installing  
⇒ [page 216](#) .

- Check the quick couplings for firm seating by pulling in the opposite direction!



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## Version 2

Push-on coupling with pull-release mechanism -arrow-

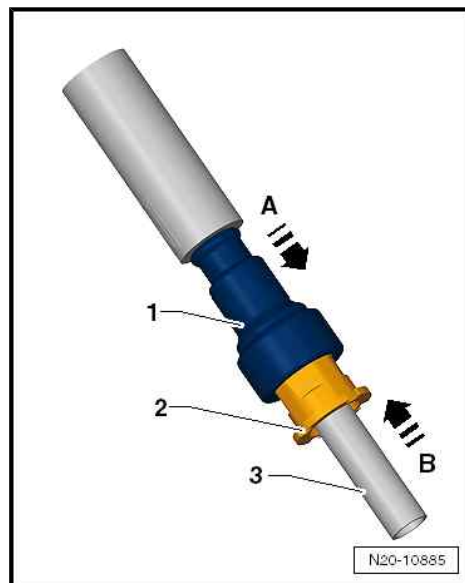


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- Press the quick coupling -1- in direction of arrow -A-.
- Pull pull-release mechanism -2- in direction of arrow -B-.
- Remove the quick coupling -1- from the fuel line -3- in direction of the arrow -B-.

Pay attention to the assignment of the colours when installing  
⇒ [page 216](#) .

- Check the quick couplings for firm seating by pulling in the opposite direction!



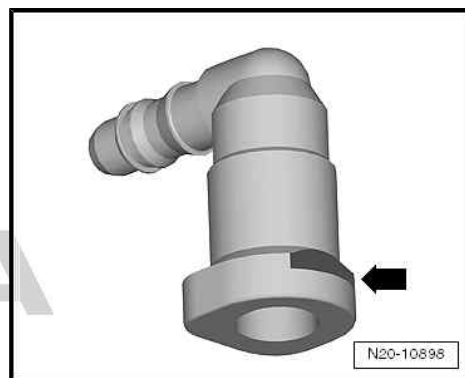
### Version 3

Quick coupling with front button -arrow-.

- Press release button -arrow- and pull off quick couplings.

Pay attention to the assignment of the colours when installing  
⇒ [page 216](#) .

- Check the quick couplings for firm seating by pulling in the opposite direction!



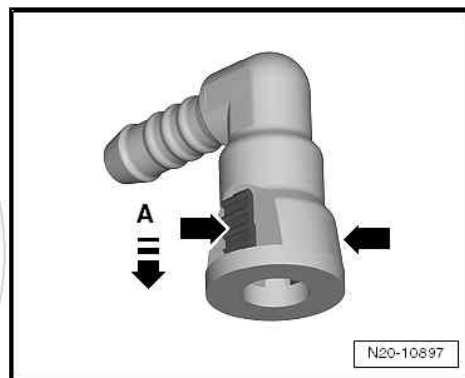
### Version 4

Quick coupling with release buttons -arrows- on right and left.

- Press the quick coupling in direction of arrow -A-.
- Press release buttons -arrow- and detach quick coupling.

Pay attention to the assignment of the colours when installing  
⇒ [page 216](#) .

- Check the quick couplings for firm seating by pulling in the opposite direction!



### Version 5

Quick coupling with release buttons -arrows- on right and left.

- Press release buttons -arrow- and detach quick coupling.

Pay attention to the assignment of the colours when installing  
⇒ [page 216](#) .

- Check the quick couplings for firm seating by pulling in the opposite direction!



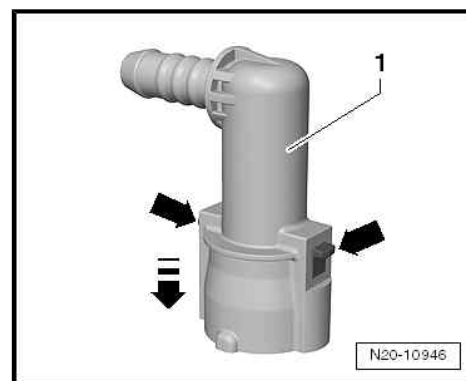
## Version 6

Quick coupling with release buttons -arrows- on right and left.

- Press push-on coupling -1- in -direction of arrow- and hold pressed.
- Press release buttons -arrow- and detach quick coupling.

Pay attention to the assignment of the colours when installing  
⇒ [page 216](#) .

- Check the quick couplings for firm seating by pulling in the opposite direction!



## 2.10 Removing and installing the fuel tank Octavia II

Special tools and workshop equipment required

- ◆ Engine/gearbox jack , e.g. -V.A.G 1383 A-

### Removing



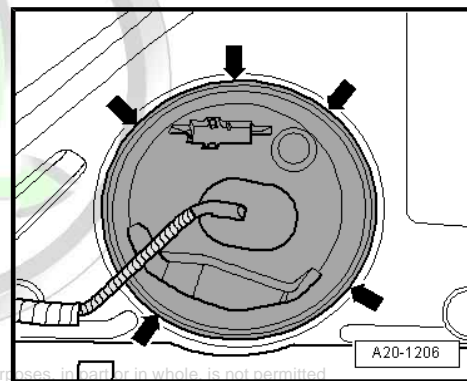
#### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ [“2.3 Safety precautions when working on fuel supply system”, page 3](#) .
- ◆ *Observe rules for cleanliness*  
⇒ [“2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system”, page 4](#) .
- Switch off ignition and pull out ignition key.
- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .
- Unclip retaining catches -arrows- of cover for the fuel delivery unit and remove cover.

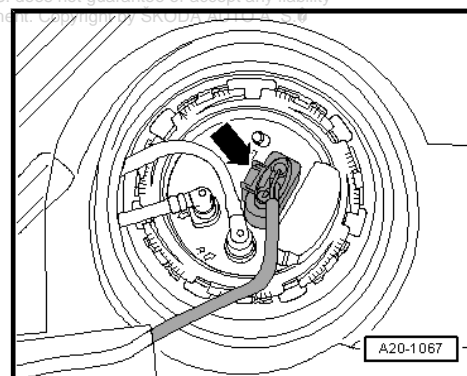


#### Note

*For vehicles with auxiliary heating, the plug connection for the dosing pump - V54- must be disconnected additionally.*



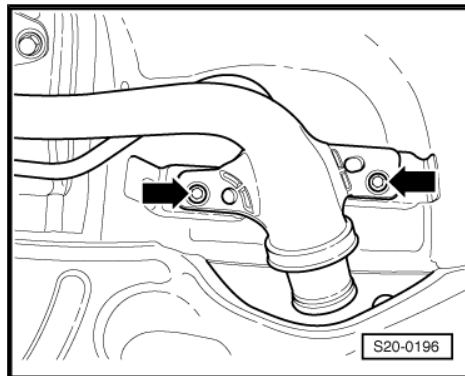
- Unplug connector -arrow-.
- Unscrew right rear wheel ⇒ Chassis; Rep. gr. 44 .
- Remove the rear right wheelhouse liner ⇒ Body Work; Rep. gr. 66 .







- Unscrew fixing bolts on filler neck -arrows-.
- Unclip the wiring loom out of the cable guide on filler neck.
- Remove rear tunnel bridge.
- Slacken front clamping sleeve at exhaust system and push to the rear.
- Undo all suspensions of rear muffler from the retaining straps.
- Slightly lower the exhaust system and tie with wire to body.
- Disconnect the feed line and the return-flow line on the front right of the fuel tank.



### Note

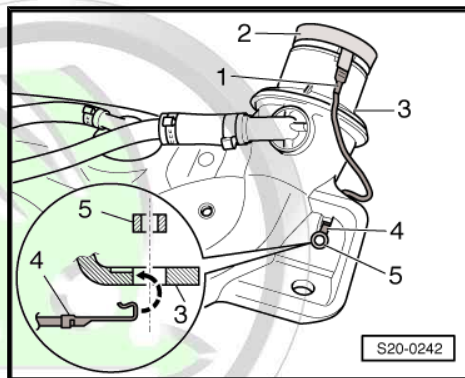
- ♦ *For vehicles with auxiliary heating, the fuel line for the dosing pump - V54- must also be disconnected.*
- ♦ *Press down the securing rings in order to unlock the connections of the fuel lines.*
- Unscrew tensioning strap.
- Support the fuel tank using the engine/gearbox jack .
- Unscrew securing bolts.
- Lower fuel tank and swivel out.

### Installing

- Check both earth connections for corrosion, if necessary remove corrosion.
- Check fitting position of the earth lead -1-.
- The plug -1- must be firmly fitted to the metal plate ring -2-.
- The contact tab -4- must be hung on the fuel tank -3- and secured with the spacer bush -5-.
- Guide the filler neck between rear axle and structure with the assistance of a 2nd mechanic. Then position the fuel tank onto the engine/gearbox jack - V.A.G 1383 A- .

Further installation occurs in reverse order. Pay attention to the following:

- ♦ Lay the vent and fuel lines without any kinks.
- ♦ Do not mix-up the feed line and the return-flow line (the return-flow line is blue, the feed line is black).
- ♦ Make sure the line connections fit tightly.
- ♦ Check the earth connection of the fuel tank at the body on the filler neck.
- ♦ After installing the fuel tank, check whether the lines are also clipped in place on the fuel tank.



### Tightening torques

- ♦ Fuel tank with attached parts  
⇒ ["2.1 Summary of components - Fuel tank with attached parts Octavia II", page 199](#) .

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## 2.11 Removing and installing the fuel tank Superb II, Yeti

Special tools and workshop equipment required

- ◆ Engine and gearbox jack , e.g. -V.A.G 1383 A-

Removing



Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ "2.3 Safety precautions when working on fuel supply system", page 3 .
- ◆ *Observe rules for cleanliness*  
⇒ "2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4 .
- Switch off all electrical components and withdraw key from ignition lock.
- Drain the fuel tank  
⇒ "2.4 Extract fuel from the fuel tank", page 205 .

For the vehicles Superb II

- Removing rear seat bench ⇒ Body Work; Rep. gr. 72 .

For the vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72 .
- Remove floor covering under the rear seats.

For all vehicles

- Remove the cover from the fuel delivery unit and from the fuel gauge sender 2 - G169- .

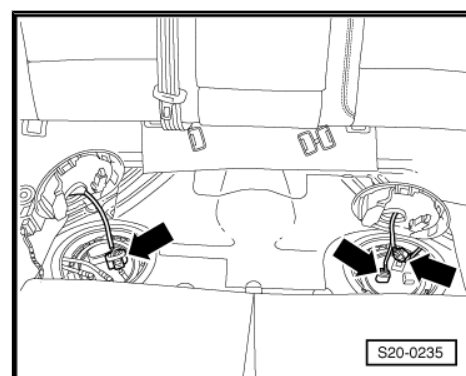


Note

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*For vehicles with auxiliary heating, the plug connection for the dosing pump - V54- must also be disconnected.*

- Disconnect the plug from the flange of the fuel delivery unit and from the flange of the fuel gauge sender 2 - G169- -arrows-.
- Open the fuel tank cap and clean around the fuel filler neck.
- Unscrew the cap from the fuel filler neck.
- Close the opening of the fuel filler neck with a clean piece of foam, so that no dirt can penetrate.
- Unscrew right rear wheel ⇒ Chassis; Rep. gr. 44 .
- Remove the rear right wheelhouse liner ⇒ Body Work; Rep. gr. 66 .





- Unscrew fixing screws on filler neck -1-.
- Unclip the electrical cable from the bracket -2- at the top and bottom of the filler neck.



**Note**

- ♦ For vehicles with auxiliary heating, the fuel line for the dosing pump - V54- must also be disconnected.
- ♦ Press down the securing rings in order to unlock the connections of the fuel lines.

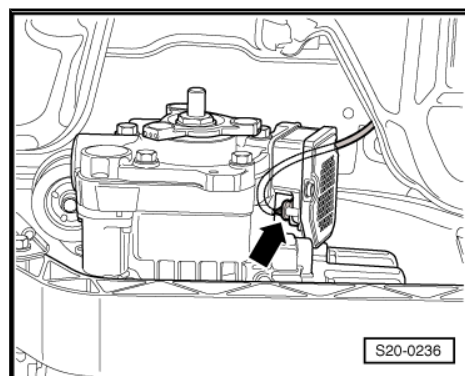
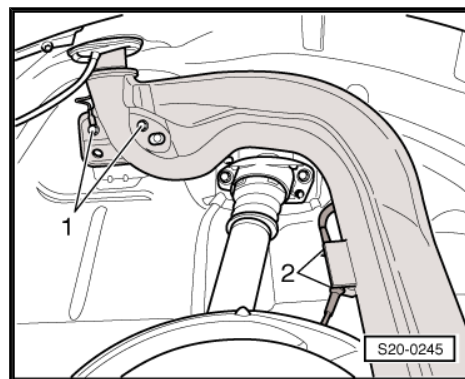
- Remove the rear tunnel bridge and rear and middle silencer:

- ♦ Superb II  
⇒ ["1.5 Summary of components - Middle and rear part of the exhaust system Superb II", page 320](#) .

- ♦ Yeti  
⇒ ["1.6 Summary of components - Middle and rear part of the exhaust system Yeti", page 321](#) .

**Vehicles with four-wheel drive**

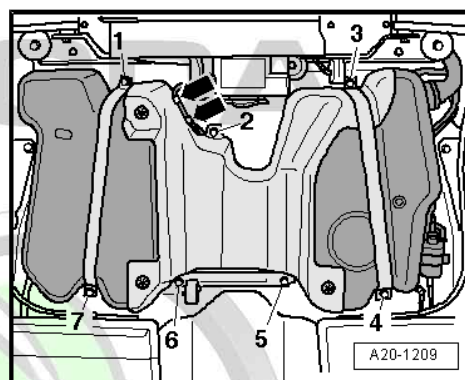
- Remove propshaft ⇒ Gearbox; Rep. gr. 39 .
- Disconnect plug -arrow- from four-wheel drive control unit - J492- .



- Unclip the cable guide of the four-wheel drive control unit -arrows-.

**Continued for all vehicles**

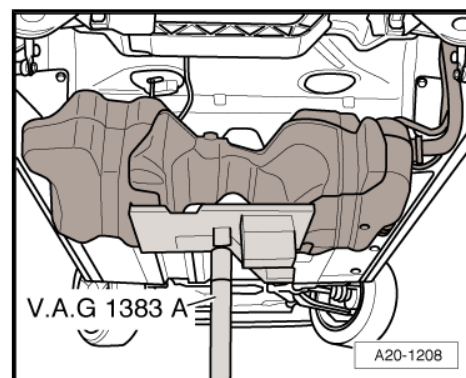
- First unscrew the screws -2-, -5- and -6-.
- Support the fuel tank using the engine and gearbox jack - V.A.G 1383 A- .
- Unscrew the screws for the tensioning straps -1-, -3- and -4-.



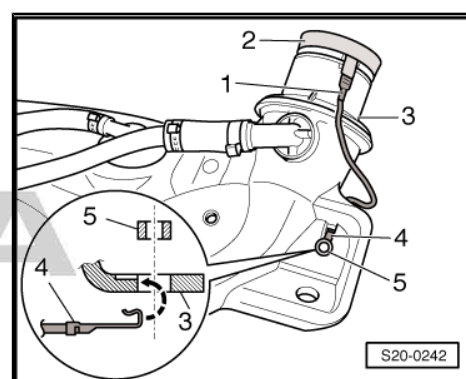
- Slightly lower the fuel tank using the engine and gearbox jack - V.A.G 1383 A- .
- Then remove the fuel tank from the engine/gearbox jack - V.A.G 1383 A- and pull through the filler neck between the body and the rear axle with the help of a second mechanic.

### Installing

- Check both earth connections for corrosion, if necessary remove corrosion.



- Check fitting position of the earth lead -1-.
- The plug -1- must be firmly fitted to the metal plate ring -2-.
- The contact tab -4- must be hung on the fuel tank -3- and secured with the spacer bush -5-.
- Guide the filler neck between rear axle and structure with the assistance of a 2nd mechanic. Then position the fuel tank onto the engine/gearbox jack - V.A.G 1383 A- .



Further installation occurs in reverse order. Pay attention to the following:

- ◆ Lay the vent and fuel lines without any kinks.
- ◆ Do not mix-up the feed line and the return-flow line (the return-flow line is blue, the feed line is black).
- ◆ Make sure the line connections fit tightly.
- ◆ Check the earth connection of the fuel tank at the body on the filler neck.
- ◆ After installing the fuel tank, check whether the lines are also clipped in place on the fuel tank.

### Tightening torques

- ◆ Fuel tank with attached parts  
⇒ ["2.2 Summary of components - Fuel tank with attached parts Superb II, Yeti", page 202](#) .

## 2.12 inspecting fuel pump

⇒ ["2.12.1 Checking function and voltage supply of fuel pump", page 223](#)

⇒ ["2.12.2 Test feed pressure of fuel pump", page 224](#)

⇒ ["2.12.3 Check the fuel flow rate of the fuel pump", page 226](#)

⇒ ["2.12.4 Check voltage consumption of the fuel pump", page 228](#)

### 2.12.1 Checking function and voltage supply of fuel pump

#### Special tools and workshop equipment required

- ◆ Auxiliary measuring set, , e. g. -V.A.G 1594 C-

#### Test conditions

- Battery voltage at least 12 V
- Fuses o.k. ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



- All electrical consumers such as the lights and rear window heater must be switched off.

#### Test sequence



#### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ "2.3 Safety precautions when working on fuel supply system", page 3.
- ◆ *Observe rules for cleanliness*  
⇒ "2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4.

#### For the vehicles Octavia II, Superb II

- Removing rear seat bench ⇒ Body Work; Rep. gr. 72.

#### For the vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72.
- Remove floor covering under the rear seats.

#### For all vehicles

- Unclip retaining catches -arrows- of cover for the fuel delivery unit and remove cover.



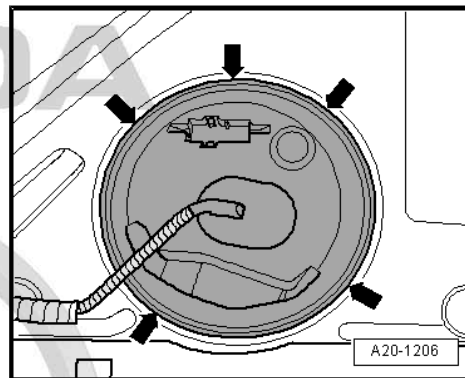
#### Note

*For vehicles with auxiliary heating, the plug connection for the dosing pump - V54- must also be disconnected.*

- Switch on ignition.
- The fuel pump must be heard to start running.
- Switch off ignition.

If the fuel pump does not run:

- Continuing searching for faults using a multimeter ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



## 2.12.2 Test feed pressure of fuel pump

#### Special tools and workshop equipment required

- ◆ Pressure gauge - VAS 6551-
- ◆ Hose adapter - VAS 6551/1-
- ◆ Hose adapter - VAS 6551/2-

#### Test conditions

- Battery voltage at least 12 V
- Fuses o.k. ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- All electrical consumers such as the lights and rear window heater must be switched off.



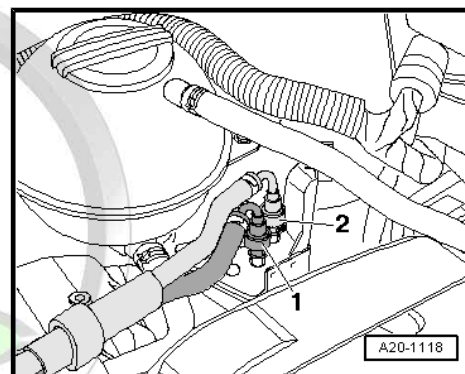
## Test sequence



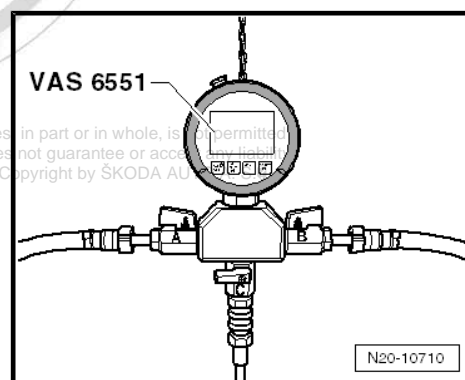
### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ [“2.3 Safety precautions when working on fuel supply system”, page 3](#).
- ◆ *Observe rules for cleanliness*  
⇒ [“2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system”, page 4](#).

- Detach the fuel feed line -2-, to do so press in the circlip. Unlock the quick coupling and disconnect  
⇒ [“2.9 Separating push-on couplings”, page 216](#).
- Connect the pressure gauge -VAS 6551- with hose adapter -VAS 6551/1- and -VAS 6551/2- to the open ends of the fuel feed line.
- Switch on the pressure gauge -VAS 6551- by pressing the button **On/Off**.



- Open the shut-off cocks “A” and “B” of the pressure gauge and close the shut-off cock “C”.
- Start engine and run in idle.
- Close the shut-off cock “B” for maximum 15 seconds and during this period, read off the pressure at the pressure gauge -VAS 6551-.
- Specified value: at least 0,05 MPa (0,5 bar).
- If the feed pressure drops temporarily, replace the fuel delivery pump:



- ◆ Octavia II  
⇒ [“2.5 Removing and installing fuel delivery unit Octavia II”, page 207](#).
- ◆ Superb II, Yeti  
⇒ [“2.6 Removing and installing fuel delivery unit Superb II, Yeti”, page 209](#).

If the specified values are reached:

- In the event of handling problems, replace the fuel filter, in order to avoid blockage of the fuel filter.

If the specified values are not reached:

### For the vehicles Octavia II, Superb II

- Removing rear seat bench ⇒ Body Work; Rep. gr. 72.

### For the vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72.
- Remove floor covering under the rear seats.

### For all vehicles

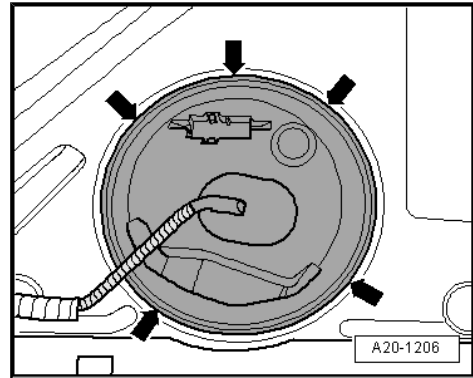


- Unclip retaining catches -arrows- of cover for the fuel delivery unit and remove cover.

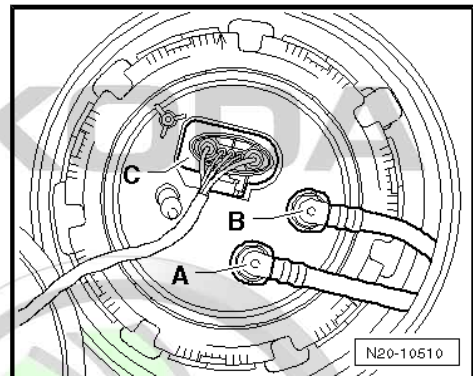


#### Note

For vehicles with auxiliary heating, the plug connection for the dosing pump - V54- must also be disconnected.



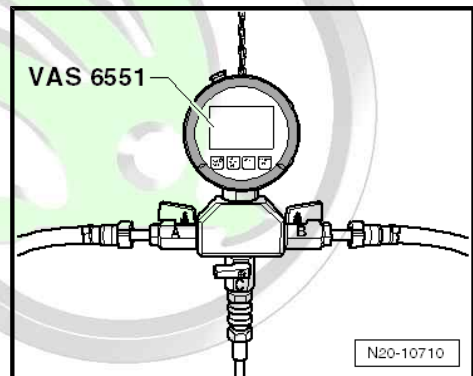
- Detach the black feed line -A- from the fuel pump. Unlock the quick coupling and disconnect  
⇒ [“2.9 Separating push-on couplings”, page 216](#) .
- Connect the pressure gauge - VAS 6551- with hose adapter - VAS 6551/1- and -VAS 6551/2- to the open ends of the fuel feed line and connect the fuel pump.
- Switch on the pressure gauge - VAS 6551- by pressing the button On/Off.



- Open the shut-off cocks “A” and “B” of the pressure gauge and close the shut-off cock “C”.
- Start engine and run in idle.
- Close the shut-off cock “B” for maximum 15 seconds and during this period, read off the pressure at the pressure gauge - VAS 6551- .
- Specified value: at least 0,05 MPa (0,5 bar).

If the nominal values are again not reached:

- Check the fuel flow rate of the fuel pump  
⇒ [“2.12.3 Check the fuel flow rate of the fuel pump”, page 226](#) .



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#### Note

After the assembly, check if all the quick couplings are correctly locked in place by pulling on them!

## 2.12.3 Check the fuel flow rate of the fuel pump

### Special tools and workshop equipment required

- ◆ Remote control , e.g. -V.A.G 1348/3A-
- ◆ Auxiliary measuring set , e. g. -V.A.G 1594 C-
- ◆ Adapter , e.g. -V.A.G 1318/16-
- ◆ Adapter , e.g. -V.A.G 1318/17-
- ◆ Measuring vessel

### Test conditions

- Battery voltage at least 12 V
- Fuel temperature 15...30 °C.

- Fuel tank at least  $\frac{1}{4}$  full.

## Test sequence



### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ *"2.3 Safety precautions when working on fuel supply system", page 3*.
- ◆ *Observe rules for cleanliness*  
⇒ *"2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4*.

- Unscrew the cap from the filler neck.

### For the vehicles Octavia II, Superb II

- Removing rear seat bench ⇒ Body Work; Rep. gr. 72.

### For the vehicles Yeti

- Remove rear seat bench with brackets ⇒ Body Work; Rep. gr. 72.
- Remove floor covering under the rear seats.

### For all vehicles

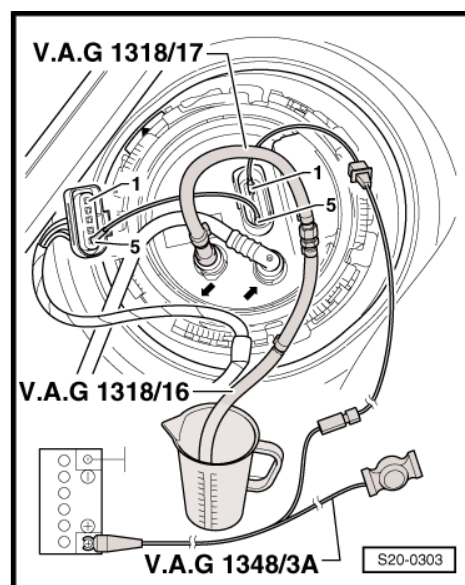
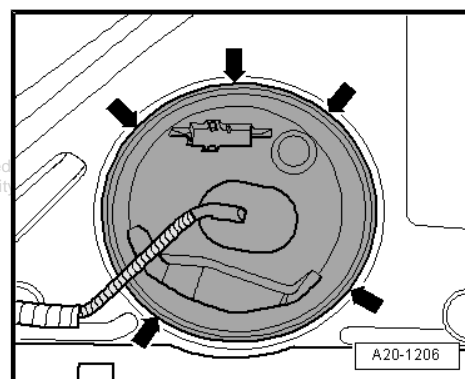
- Unclip retaining catches -arrows- of cover for the fuel delivery unit and remove cover.



### Note

*For vehicles with auxiliary heating, the plug connection for the dosing pump - V54- must also be disconnected.*

- Disconnect the plug for the fuel delivery unit.
- Connect remote control - V.A.G 1348/3A- with connection lines from measuring tool set to contact -1- of the fuel pump and to battery positive terminal.
- Use connection lines from the measuring tool set to connect the contacts -5- to the plug and to the fuel pump.
- Pull off the fuel feed line from the flange of the fuel delivery unit. Unlock the quick coupling and disconnect  
⇒ *"2.9 Separating push-on couplings", page 216*.
- Connect adapter - V.A.G 1318/17- and adapter - V.A.G 1318/16- , fit onto the feed support and hold in a measuring vessel.
- Activate the remote control - V.A.G 1348/3A- for 30 seconds.
- Measure the battery voltage.



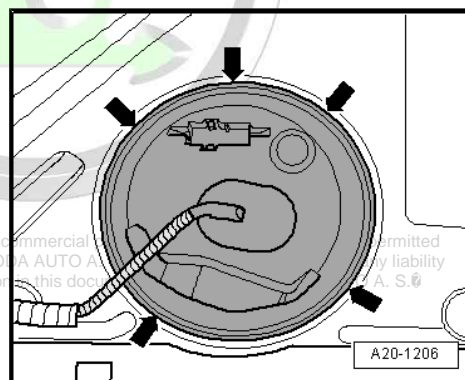
- 

Graph of  $I/30s$  vs  $V$  for S20-0278. The x-axis is  $V$  (8 to 14) and the y-axis is  $I/30s$  (0 to 2). The curve shows a linear relationship.

$V$	$I/30s$
8	0.3
9	0.5
10	0.7
11	0.9
12	1.1
13	1.3
14	1.5



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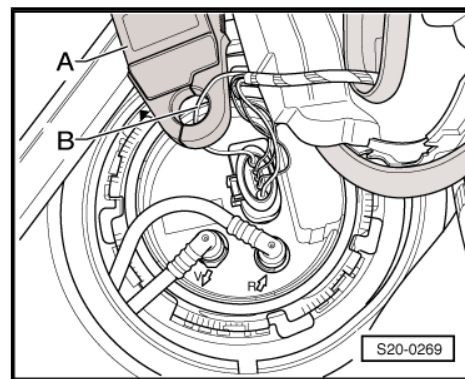


- Connect the current probe -A- of the vehicle diagnosis-, measurement- and information system - VAS 5051- to the line -B- to contact 1 of the connector.
- Start engine and run in idle.
- Measure current draw of fuel pump.  
Set value: max. 7.5 A



#### Note

*If the failure in the fuel supply is occasional the test may be performed during a test drive. The assistance of a 2nd mechanic is required.*



If the power consumption is exceeded, the fuel pump is defective:

- Replace fuel delivery unit:
- ◆ Octavia II  
⇒ [“2.5 Removing and installing fuel delivery unit Octavia II”, page 207](#).
- ◆ Superb II and Yeti  
⇒ [“2.6 Removing and installing fuel delivery unit Superb II, Yeti”, page 209](#).

## 2.13 Summary of components - Additional pressure pump - V393-



#### Note

*Additional pressure pump - V393- is only delivered complete with mounting bracket as a spare part ⇒ ETKA - Electronic Catalogue of Original Parts .*

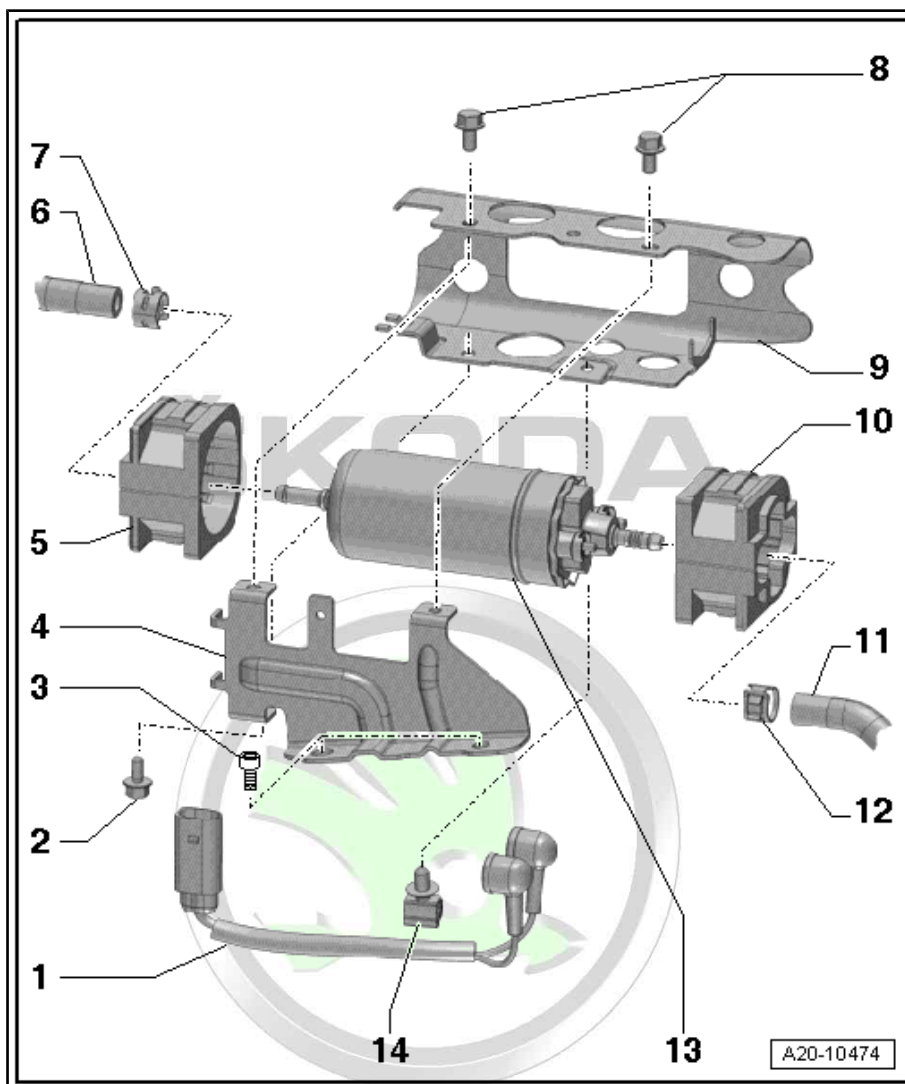


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- 1 - Electrical cable with connector
- 2 - Screw
  - 9 Nm
- 3 - Screw
  - 20 Nm
- 4 - Mounting bracket
- 5 - Rubber bearing
- 6 - Fuel hose
  - from fuel filter
  - white marking
- 7 - Spring strap clamp
- 8 - Screw
  - 9 Nm
- 9 - Mounting bracket
- 10 - Rubber bearing
- 11 - Fuel hose
  - to high pressure pump
  - white marking
- 12 - Spring strap clamp
- 13 - Additional fuel pump - V393-
  - Removing and installing  
⇒ ["2.14 Removing and installing additional fuel pump V393"](#),  
[page 230](#)
- 14 - Bracket for electric cable



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## 2.14 Removing and installing additional fuel pump - V393-



### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ ["2.3 Safety precautions when working on fuel supply system"](#), [page 3](#).
- ◆ *Observe rules for cleanliness*  
⇒ ["2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system"](#), [page 4](#).
- ◆ *The additional fuel pump - V393- is only supplied as a spare part complete with the bracket.*

## Removing

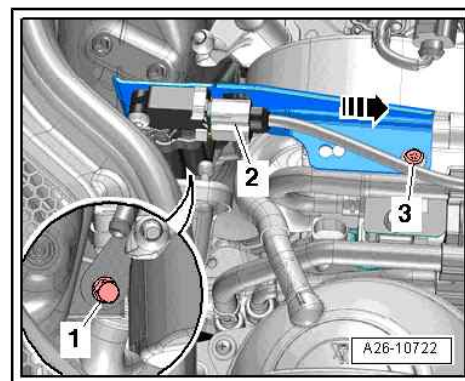
- Disconnect plug connection -2- at exhaust gas pressure sensor 1 - G450- .
- Screw out screw -3- and remove bracket with exhaust gas pressure sensor 1 - G450- from the bracket for the additional fuel pump in -direction of arrow-.
- Place the bracket with the exhaust gas pressure sensor 1 - G450- to the rear.



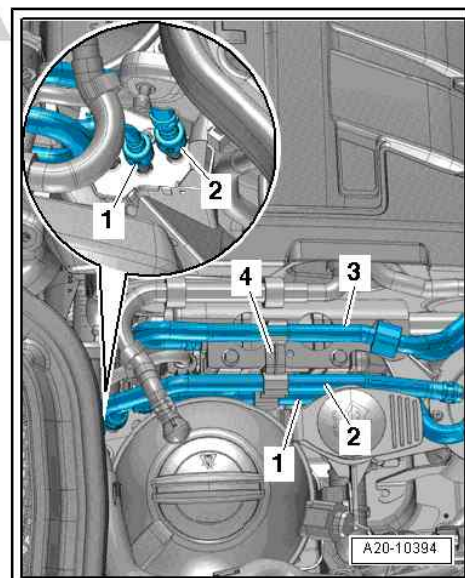
### Caution

#### *Risk of damage!*

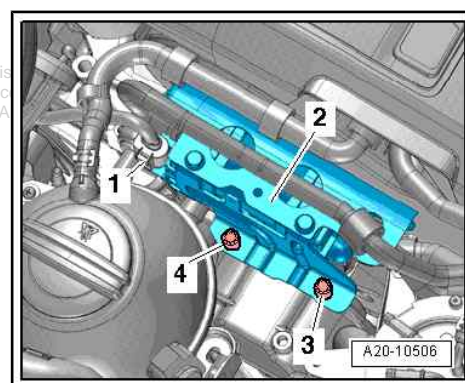
- ♦ *The exhaust gas pressure sensor 1 - G450- is very sensitive and must therefore not touch somewhere when laying it down with the bracket.*



- Unhook the fuel hoses -1-, -2- and -3- on the bracket and remove the bracket -4-.



- Disconnect plug connection -1-.
- Unscrew screws -3- and -4- and remove bracket -2- with additional fuel pump.

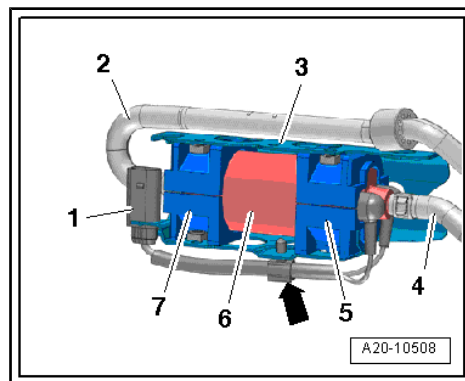




- Open the spring strap clamps and remove the fuel hoses -2- and -4-.

### Installing

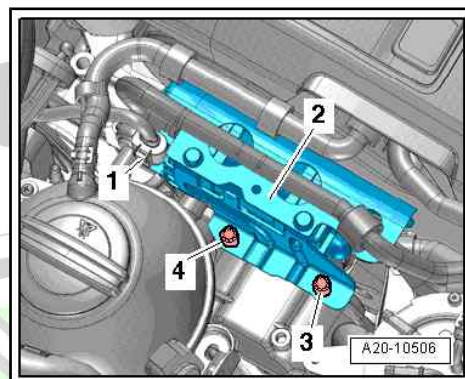
Installation is carried out in the reverse order. When installing, observe the following:



- Tighten the screws -3- and -4- to the specified tightening torque.
- After replacing the additional fuel pump - V393- , fill up the fuel system  
⇒ [“2.9 Fill the high pressure pump with fuel and discharge the fuel system”, page 290](#) .

### Tightening torques

- ◆ Screws of the bracket  
⇒ [“2.13 Summary of components - Additional pressure pump V393”, page 229](#)



## 3 Accelerator control

⇒ [“3.1 Assembly overview - accelerator module”, page 233](#)

⇒ [“3.2 Removing and installing accelerator pedal module”, page 233](#)

### 3.1 Assembly overview - accelerator module

#### 1 - Connector

- ☐ disconnect and fit on  
⇒ [“3.2.1 Disconnect connector for accelerator pedal module and fit on”, page 235](#)

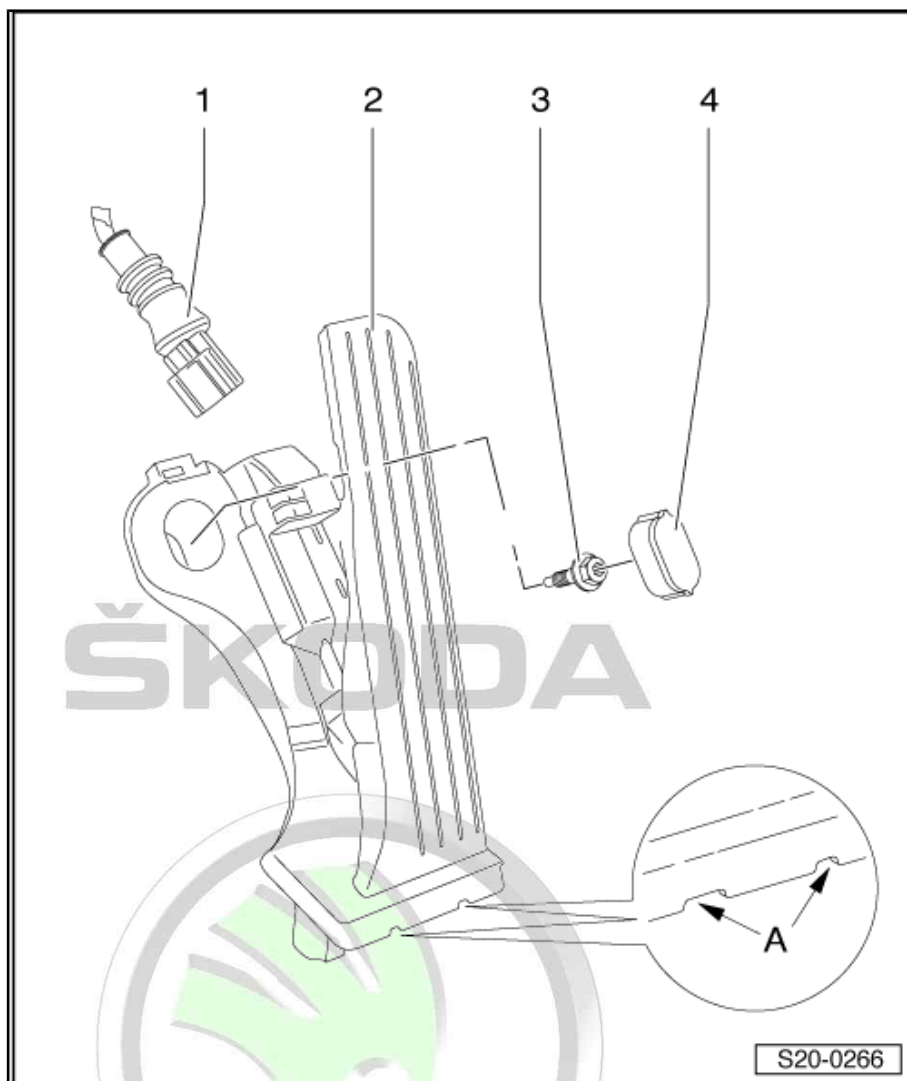
#### 2 - Accelerator pedal module

- ☐ with accelerator pedal position sender - G79- and accelerator pedal position sender 2 - G185-
- ☐ not adjustable
- ☐ -A- openings for release tool - T10238- or - T10240-
- ☐ Removing and installing  
⇒ [“3.2 Removing and installing accelerator pedal module”, page 233](#)
- ☐ when replacing, the engine control unit must be adapted ⇒ Vehicle diagnostic tester on vehicles with automatic gearbox

#### 3 - Screw

- ☐ 10 Nm

#### 4 - Cap



### 3.2 Removing and installing accelerator pedal module

⇒ [“3.2.1 Disconnect connector for accelerator pedal module and fit on”, page 235](#)

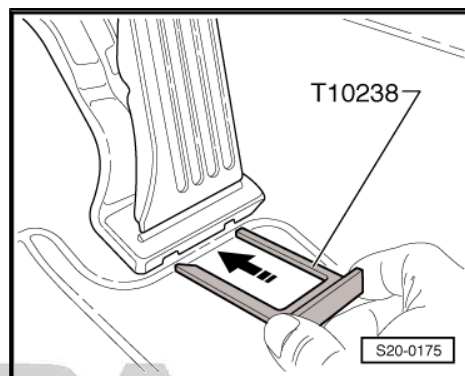
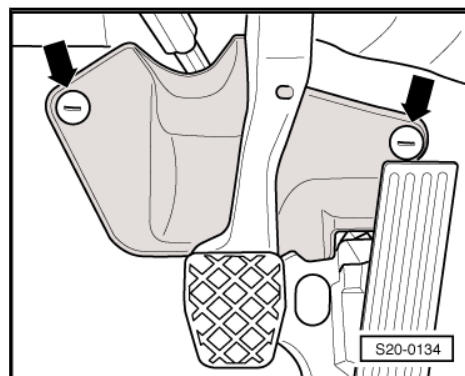
#### Special tools and workshop equipment required

- ◆ Release tool - T10238- (for left-hand drive vehicle)
- ◆ Release tool - T10240- (for right-hand drive vehicle)

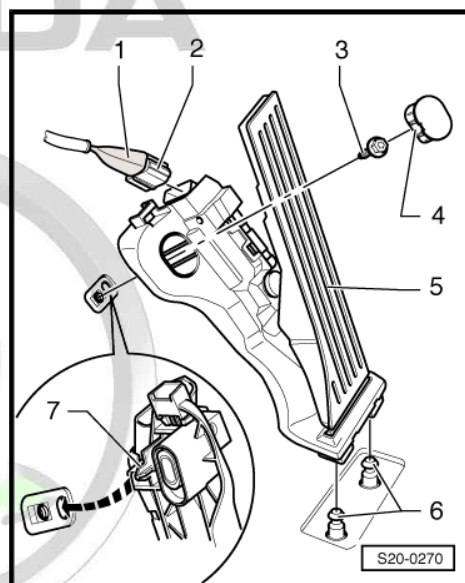
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## Removing

- Remove steering column trim panel -arrows-.
- Disconnect connector at accelerator pedal module  
⇒ [“3.2.1 Disconnect connector for accelerator pedal module and fit on”, page 235](#) .
- Lever out the cap Pos. -4- with a screwdriver  
⇒ [“3.1 Assembly overview - accelerator module”, page 233](#) .
- Unscrew fixing screw  
⇒ [“3.1 Assembly overview - accelerator module”, page 233](#) ,  
Pos. -3-.
- Push the release tool - T10238- (for right-hand drive release tool - T10240- ) as shown up to the stop into the provided openings and remove the accelerator pedal module.



- Fit the plug -2- onto the accelerator pedal module -5-  
⇒ [“3.2.1 Disconnect connector for accelerator pedal module and fit on”, page 235](#) .
- Push again rubber grommet -1- onto the connector -2-.
- Push accelerator pedal module onto the securing bolt -6-.
- Insert the centering pin -7- into the hole in the underbody.
- Screw on accelerator pedal module with fixing screw -3- and fit the cap -4-.
- Install steering column cover.



## Note

*If the accelerator pedal module was replaced, an adaptation of the engine control unit has to be performed on vehicles with automatic gearbox ⇒ Vehicle diagnostic tester.*

## Tightening torques

- ◆ Screw for accelerator pedal  
⇒ [“3.1 Assembly overview - accelerator module”, page 233](#)

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### 3.2.1 Disconnect connector for accelerator pedal module and fit on

⇒ "2.12.2 Test feed pressure of fuel pump", page 224



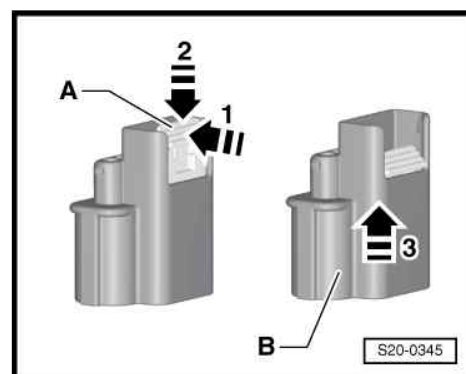
#### Note

*The different connectors for the accelerator pedal module which are inserted, must be disconnected and fit on in a different manner.*

#### Disconnect connector 1K0 973 706

- Lightly press the piston slide valve -A- (grey) in direction of arrow -1- and slide as far as it can go in the direction of arrow -2-.
- Hold the piston slide valve in this position and disconnect the socket housing -B- in direction of arrow -3-

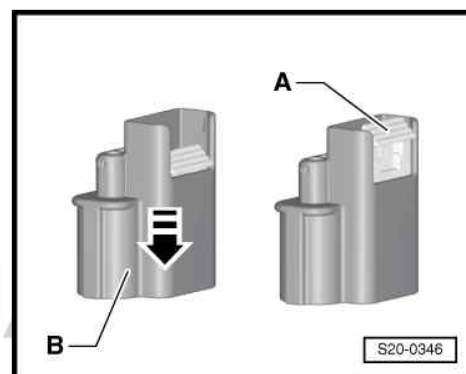
The piston slide valve -A- is pushed into the bottom position.



#### Fit on connector 1K0 973 706

- Push the socket housing -B- in -direction of arrow- until the piston slide valve can be heard to lock in place.

The piston slide valve -A- moves automatically upwards.



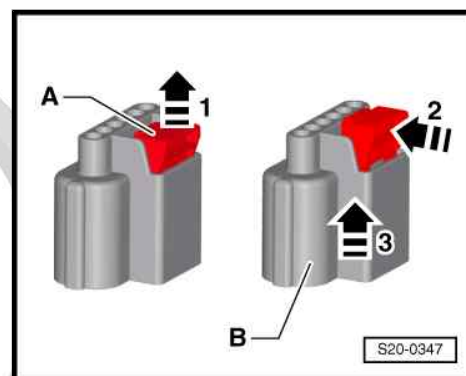
#### Note

*For safety reasons, check the connector for secure catch by tightening it in the opposite direction.*

#### Disconnect connector 8K0 973 706

- Pull slider -A- (red) in direction of arrow -1- as far as the stop.
- Press the piston slide valve in direction of arrow -2- and disconnect the socket housing -B- in direction of arrow -3-

The piston slide valve -A- remains in the top position.





### Fit on connector 8K0 973 706

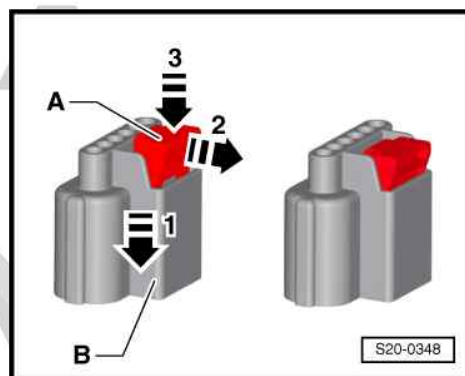
- Push connector housing -B- in direction of arrow -1- as far as the stop.
- Lightly press the piston slide valve in direction of arrow -2- and slide in the direction of arrow -3-.

The piston slide valve -A- can only be pushed down if the socket housing was pushed up to the stop.



#### Note

*For safety reasons, check the connector for secure catch by tightening it in the opposite direction.*



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## 21 – Turbocharging/supercharging

### 1 Charge-air system - exhaust gas turbocharger

⇒ [“1.1 Summary of components - exhaust gas turbocharger with component parts”, page 237](#)

⇒ [“1.2 Removing and installing exhaust gas turbocharger”, page 240](#)

⇒ [“1.3 Removing and installing exhaust gas temperature sender 1 G235 \( temperature sender upstream turbocharger G507 \)”, page 245](#)

⇒ [“1.4 Connection diagram for vacuum hoses”, page 246](#)

⇒ [“1.5 Checking the vacuum system”, page 247](#)

⇒ [“1.6 Replacing and adjusting the vacuum setting element for exhaust turbocharger”, page 249](#)



#### Note

- ◆ *Observe rules for cleanliness*  
⇒ [“2.5 Regulations concerning cleanliness when working on the exhaust gas turbocharger”, page 5](#).
- ◆ *Observe general instructions for charge-air system*  
⇒ [“2.6 General instructions for charge air system”, page 5](#).

### 1.1 Summary of components - exhaust gas turbocharger with component parts

The exhaust turbocharger and the exhaust manifold are one component part.

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#### 1 - Screw

- ☐ 10 Nm

#### 2 - Oil feed line

- ☐ Undoing and tightening union nut with socket wrench insert - T40055-
- ☐ At the same time counterhold the hexagon of the connection fitting using the key - T10461- .
- ☐ check continuity
- ☐ before installing, fill the bearing assembly of the exhaust gas turbo-charger on the connection fitting with engine oil
- ☐ 22 Nm

#### 3 - Exhaust gas turbocharger

- ☐ only complete with exhaust manifold
- ☐ Removing and installing  
⇒ ["1.2 Removing and installing exhaust gas turbocharger", page 240](#)
- ☐ Remove and install the connection pipe for the intake hose  
⇒ ["3.5 Removing and installing air filter housing", page 307](#)

#### 4 - Screw

- ☐ Replace after removal
- ☐ 8 Nm

#### 5 - Vacuum setting element

- ☐ for position sender for charge pressure regulator - G581-
- ☐ replacing and adjusting  
⇒ ["1.6 Replacing and adjusting the vacuum setting element for exhaust turbocharger", page 249](#)
- ☐ Replacement parts set ⇒ ETKA - Electronic Catalogue of Original Parts

#### 6 - Locknut (high)

- ☐ Replace after removal
- ☐ 8 Nm

#### 7 - Adjusting nut

- ☐ Replace after removal
- ☐ 8 Nm

#### 8 - Connector

- ☐ to position sender for charge pressure regulator - G581-

#### 9 - Heat shield collar

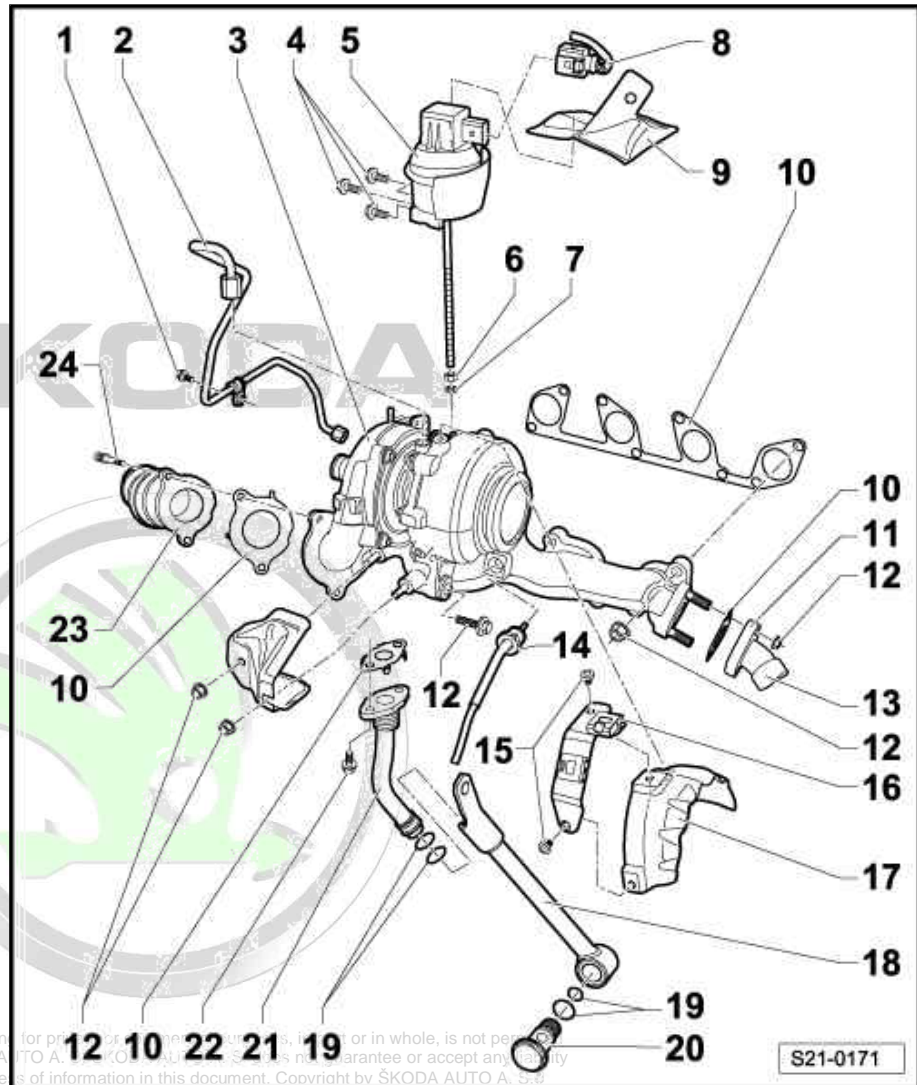
- ☐ Replace if damaged.

#### 10 - Seal

- ☐ Replace after removal

#### 11 - Connecting pipe

- ☐ to radiator for exhaust gas recirculation



## 12 - Nut

- ☐ Replace after removal
- ☐ 25 Nm

## 13 - Connecting pipe

- ☐ to radiator for exhaust gas recirculation



### Caution

*Pay attention that the bellows of the connection pipe is not bent or overstretched. There is a risk of crack formation.*

## 14 - Exhaust gas temperature sender 1 - G235- ( Temperature sender upstream of turbocharger - G507- )

- ☐ the thread of a new sender must be coated with assembly paste
- ☐ coat thread with hot bolt paste - G 052 112 A3- before installing a used sender
- ☐ Removing and installing  
⇒ ["1.3 Removing and installing exhaust gas temperature sender 1 G235 \( temperature sender upstream turbocharger G507 \)", page 245](#)
- ☐ 45 Nm

## 15 - Screw

- ☐ 15 Nm

## 16 - Mounting bracket

- ☐ for oil feed line

## 17 - Heat shield

## 18 - Support for exhaust gas turbocharger

- ☐ for oil return-flow line

## 19 - Sealing ring

- ☐ Replace after removal

## 20 - Hollow screw

- ☐ 60 Nm

## 21 - Oil return pipe



### Caution

*Before installing, check whether the bellows of the oil return pipe is not bent or overstretched. If this is the case, micro-cracks might occur which can result in leaks. Replace damaged oil return pipe or support for exhaust gas turbocharger.*

## 22 - Screw

- ☐ 15 Nm

## 23 - Pulsation dampener

## 24 - Screw

- ☐ 10 Nm





## 1.2 Removing and installing exhaust gas turbocharger

### Special tools and workshop equipment required

- ◆ Pliers for spring-type clips
- ◆ Key - T10461-
- ◆ Radiator protection mat - VAS 531003-

### Removing



#### Caution

*In case of mechanical damage to the exhaust gas turbocharger, e.g. damage of the compressor wheel, it is not sufficient to only replace the exhaust gas turbocharger. In order to prevent consequential damage to the engine, perform the following tasks:*

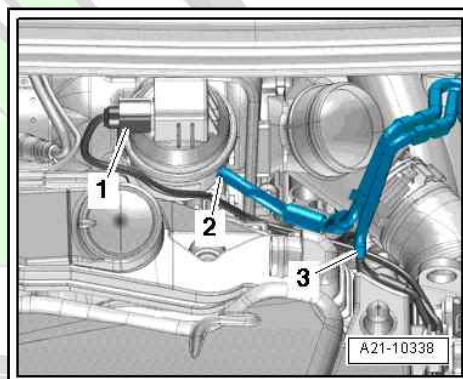
- ◆ *Clean all oil lines.*
- ◆ *Change engine oil and oil filter.*
- ◆ *Check air filter housing, air filter element and charge air pipes as well as charge air hoses for soiling.*
- ◆ *Check all the air guides and the charge air cooler for foreign bodies.*

*If foreign bodies are detected in the charge air system, the complete charge-air routing must be cleaned and if necessary the charge air cooler must also be replaced.*



#### Note

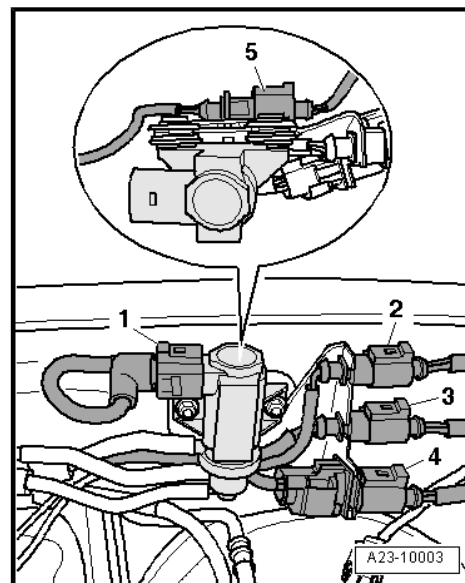
- ◆ *Observe rules for cleanliness*  
⇒ *"2.5 Regulations concerning cleanliness when working on the exhaust gas turbocharger", page 5* .
- ◆ *Observe general instructions for charge-air system*  
⇒ *"2.6 General instructions for charge air system", page 5* .
- Remove pre-exhaust pipe with diesel particle filter  
⇒ *"1.7 Removing and installing pre-exhaust pipe with diesel particle filter", page 321* .
- Remove air filter housing with air mass meter - G70- and intake hose  
⇒ *"3.5 Removing and installing air filter housing", page 307* .
- Remove the heat shield collar and disconnect the plug -1- on the position sender for charge pressure regulator - G581- .
- Remove vacuum hose -2- from vacuum setting element of exhaust turbocharger.
- Disconnect vacuum hose -3-.



- Disconnect plug connection -3- for exhaust gas temperature sender 1 - G235- ( temperature sender upstream turbocharger - G507- ) and expose electrical cable.

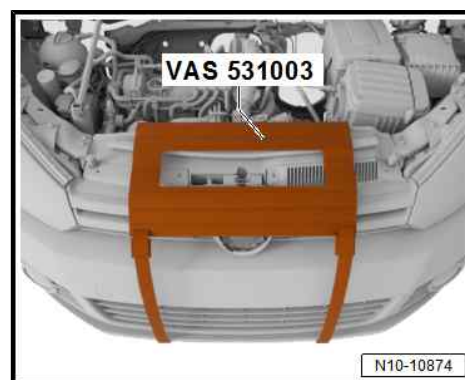
**For the vehicles Octavia II, Superb II**

- Remove fan shroud with radiator fans  
⇒ [“4.2 Removing and installing fan shroud for radiator fan”, page 188](#) .



- Cover radiator with radiator protection mat - VAS 531003- .

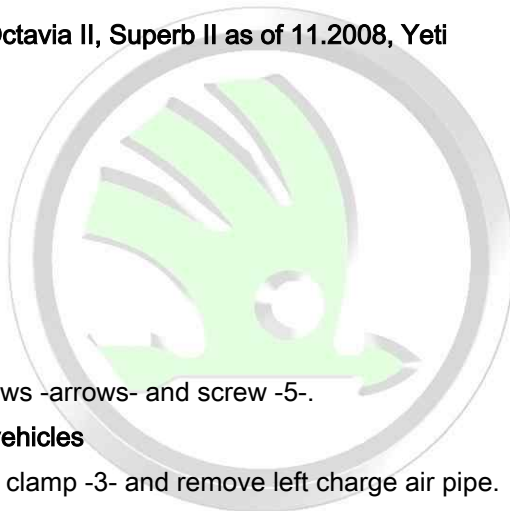
**For the vehicles Superb II up to 10.2008**



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- Unscrew screws -2- and -5- and screws -arrows-.

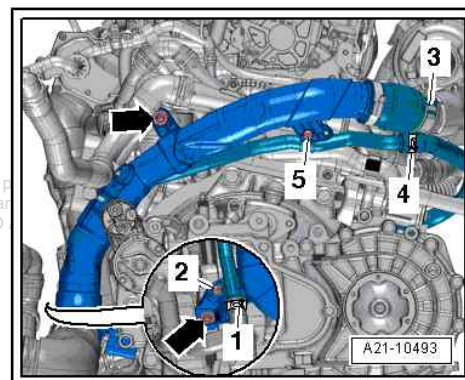
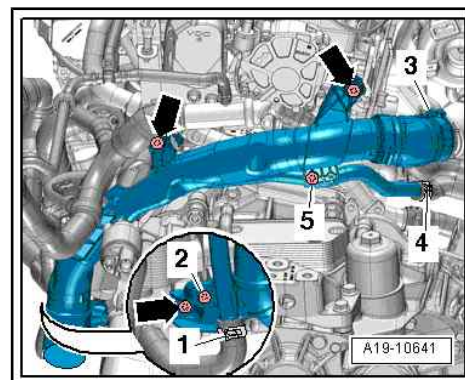
**For the vehicles Octavia II, Superb II as of 11.2008, Yeti**



- Screw out screws -arrows- and screw -5-.

**Continued for all vehicles**

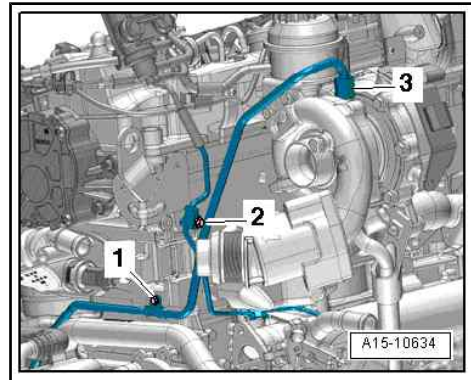
- Release screw clamp -3- and remove left charge air pipe.



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- Slacken the union nut -3- and unscrew the oil feed line from the connection on the exhaust turbocharger. At the same time counterhold the hexagon of the connection fitting using the key - T10461- .



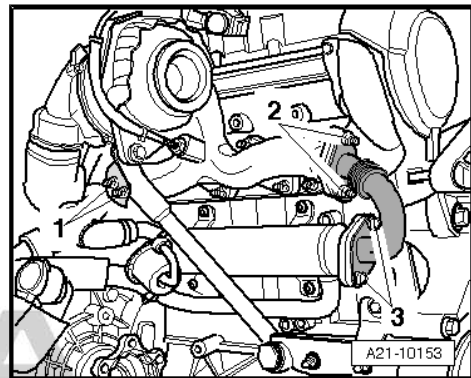
- Release nuts -1- and remove heat shield from exhaust manifold.



#### Caution

*Pay attention that the bellows of the connection pipe is not bent or overstretched. There is a risk of crack formation.*

- Release nuts -2- and screws -3- and remove exhaust gas recirculation pipe.



#### Caution

*The exhaust gas temperature sender 1 - G235- ( temperature sender upstream turbocharger - G507- ) covers the top bolted connection of the support for exhaust turbocharger and must not be bent. For this reason it must be removed.*

- Remove exhaust gas temperature sender 1 - G235- ( temperature sender upstream turbocharger - G507- )  
⇒ [“1.3 Removing and installing exhaust gas temperature sender 1 G235 \( temperature sender upstream turbocharger G507 \)”, page 245](#) .

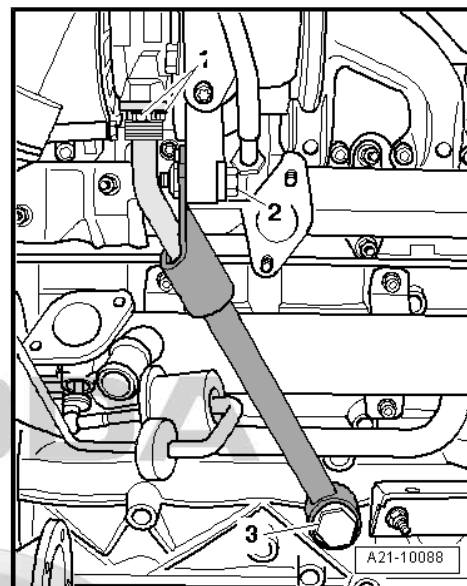
#### On vehicles with four-wheel drive

- Remove right flange shaft from angle gearbox ⇒ Gearbox; Rep. gr. 39 ⇒ Chapter “Replacing gasket ring for right flange shaft” .

#### Continued for all vehicles

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- Unscrew screws -1- and -2- and hollow screw -3-.
- Remove support for exhaust turbocharger with oil return line.



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- Unscrew nuts -arrows- and remove the exhaust gas turbo-charger with exhaust manifold from the cylinder head.
- Remove exhaust turbocharger with exhaust manifold down-wards, to do so slightly push the engine/gearbox assembly to the front.

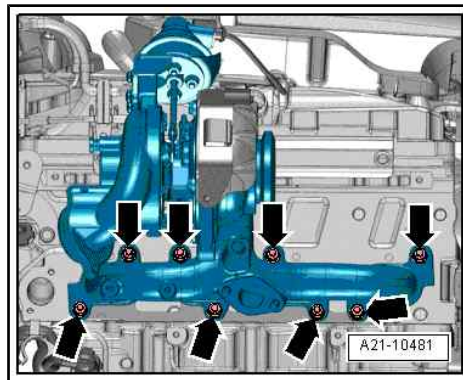
### Installing

Installation is carried out in the reverse order. When installing, observe the following:



### Caution

**Before installing, check whether the bellows of the oil return pipe is not bent or overstretched. If this is the case, microcracks might occur which can result in leaks. Replace damaged oil return pipe or support for exhaust gas turbocharger.**



### Note

- ◆ Replace the gaskets, the sealing rings and the self-locking nuts.
- ◆ Fill exhaust turbocharger with engine oil through the connection fitting of the oil feed line.
- ◆ Remove oil and grease from the charge air pipes and hoses and from their connections before installing.
- ◆ Observe the assembly instruction for hose connections with push-fit couplings ⇒ ["2.6 Hose connections", page 261](#).
- ◆ Secure all hose connections with screw clamps.
- ◆ Only install approved clamps for securing the hose connections ⇒ ETKA - Electronic Catalogue of Original Parts.
- Checking the oil level:
  - ◆ ⇒ Maintenance ; Booklet Octavia II .
  - ◆ ⇒ Maintenance ; Booklet Superb II .
  - ◆ ⇒ Maintenance ; Booklet Yeti .



### Note

To ensure the oil supply to the exhaust gas turbocharger, leave the engine running for about 1 minute after installing the exhaust gas turbocharger.

### Tightening torques

- ◆ Exhaust gas turbocharger with component parts  
⇒ ["1.1 Summary of components - exhaust gas turbocharger with component parts", page 237](#).
- ◆ Charge air pipe Octavia II  
⇒ ["2.1 Summary of components - Charge air cooler Octavia II", page 255](#).
- ◆ Charge air pipe Superb II  
⇒ ["2.2 Summary of components - Charge air cooler Superb II", page 256](#).



- ◆ Charge air pipe Yeti  
⇒ ["2.3 Summary of components - Charge air cooler Yeti", page 257](#).

### 1.3 Removing and installing exhaust gas temperature sender 1 - G235- ( temperature sender upstream turbocharger - G507- )

#### Special tools and workshop equipment required

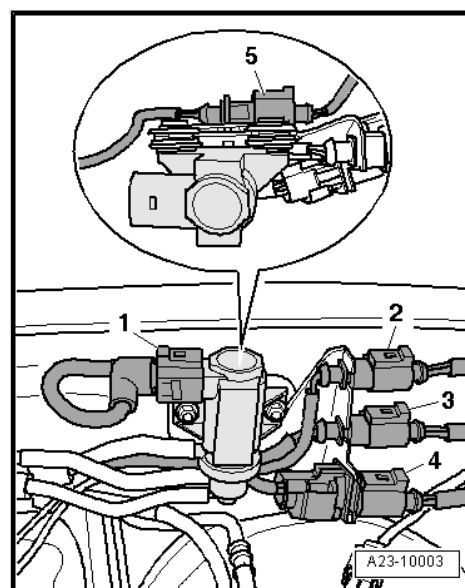
- ◆ Set of tools - T10395-

#### Removing

- Disconnect plug connection -3- for exhaust gas temperature sender 1 - G235- ( temperature sender upstream turbocharger - G507- ) and expose electrical cable.

#### For vehicles with four-wheel drive

- Remove propshaft ⇒ Gearbox; Rep. gr. 39 .



#### Continued for all vehicles

- Unscrew exhaust gas temperature sender 1 - G235- ( temperature sender upstream turbocharger - G507- ) -1- from the exhaust manifold using the socket insert SW 17 from the set of tools - T10395- .

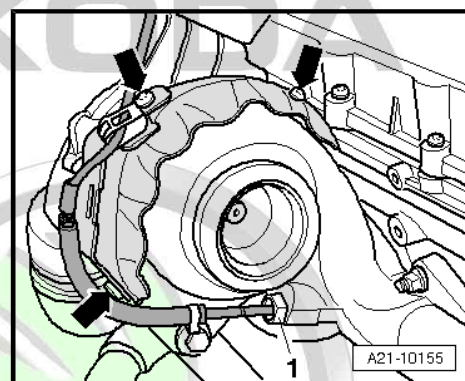
#### Installing

Installation is carried out in the reverse order. When installing, observe the following:



#### Note

- ◆ *The thread of the new temperature sender must be coated with assembly paste.*
- ◆ *Grease only the thread with hot bolt paste - G 052 112 A3- for re-used temperature sender.*
- ◆ *All cable straps should be fastened again in the same place when installing.*



Fitting position of the exhaust gas temperature sender 1 - G235- ( temperature sender upstream turbocharger - G507 - ):

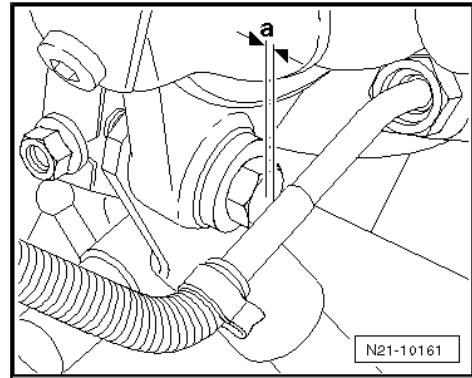
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- The dimension -a- should not be less than 5 mm.

#### Tightening torques

- ♦ Exhaust gas temperature sender 1 - G235- ( Temperature sender upstream of turbocharger - G507- )  
⇒ ["1.1 Summary of components - exhaust gas turbocharger with component parts", page 237](#)



## 1.4 Connection diagram for vacuum hoses

### 1 - Vacuum setting element

- ☐ at exhaust gas turbo-charger
- ☐ for position sender for charge pressure regulator - G581-

### 2 - Solenoid valve for charge pressure control - N75-

### 3 - Silencer

### 4 - Air filter housing

### 5 - To the brake servo unit

### 6 - Connection piece

- ☐ at the vacuum pump

### 7 - Non-return valve

- ☐ Check fitting position
- ☐ the positive side points to the cylinder head cover

### 8 - Changeover valve for radiator of exhaust gas recirculation - N345-

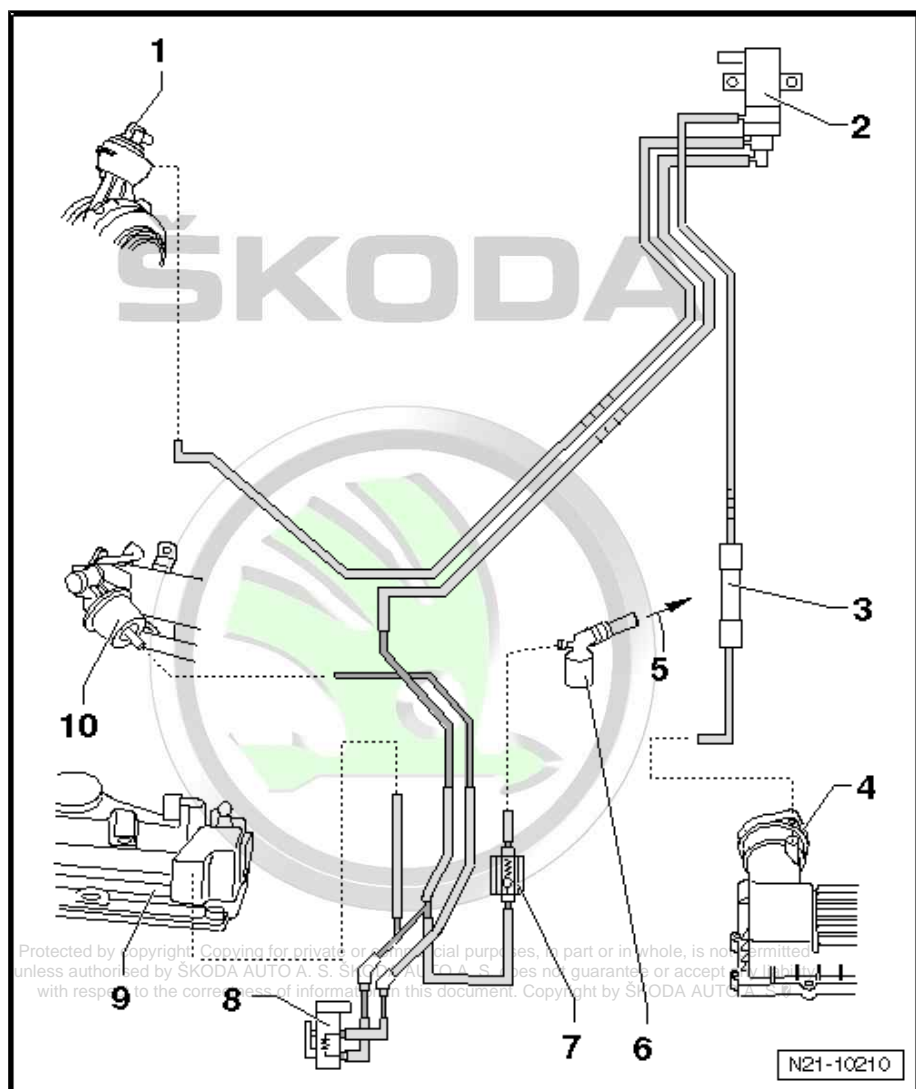
- ☐ Check change-over  
⇒ ["2.4 Check change-over of radiator for exhaust gas recirculation", page 334](#)

### 9 - Vacuum reservoir

- ☐ in the cylinder head cover

### 10 - Vacuum setting element

- ☐ for changeover flap for radiator of exhaust gas recirculation



## 1.5 Checking the vacuum system



### Caution

*When routing the vacuum lines, make sure that the lines are not kinked, twisted or crimped. Otherwise this can lead to breakdown.*

### Special tools and workshop equipment required

- ◆ Hand vacuum pump , e.g. -VAS 6213-
- Remove engine cover  
⇒ ["1.1 Removing and installing engine trim panel", page 7](#) .

### Check supply line, vacuum reservoir and non-return valve.

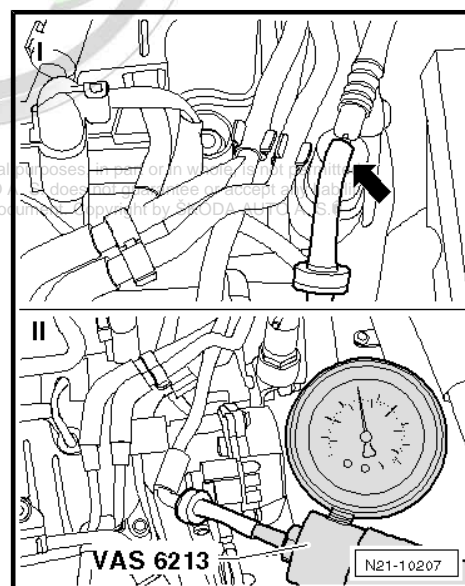
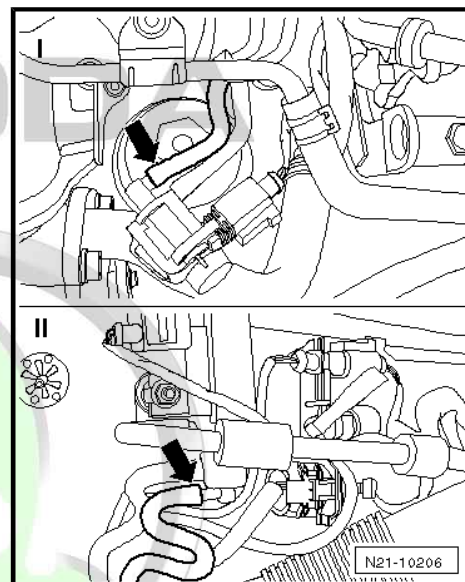
- Unclip the changeover valve for radiator of exhaust gas recirculation - N345- from the front bracket at the intake manifold.
- Remove vacuum hose on lower connection -arrow- in -I- from the Changeover valve for radiator of exhaust gas recirculation - N345- and from the Pressure control solenoid valve - N75- -arrow- in -II-.
- Close off the open hose ends with suitable dummy plugs.



### Note

*Do not use any thread screws or thread bolts.*

- Detach the vacuum hose -arrow- in -I- on the connecting piece of the vacuum pump.



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### Note

*In order to generate "vacuum", push the ring -1- for the hand vacuum pump - VAS 6213- into position -A-.*

- Attach the hand vacuum pump - VAS 6213- to the detached hose and generate a vacuum of 0.06 MPa (0.6 bar).
- Observe the pressure gauge of the hand vacuum pump for approx. 30 seconds.
- The vacuum must not drop.

If the vacuum drops:

- Search for damage, for example a leaky connection in the hose line, and replace the corresponding part.

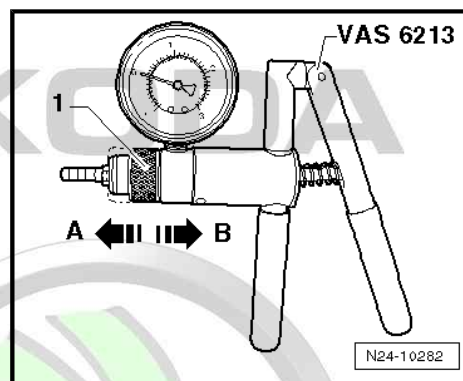
If the vacuum does not drop:

- First of all, detach the hose at the hand vacuum pump - VAS 6213- .
- Remove one of the dummy plugs from the hose ends.

If the check valve is functional, a clear hissing will be audible due to the Y in the vacuum drop in the vacuum tank.

If no spluttering can be heard:

- Replace non-return valve.
- Re-connect all vacuum hoses.



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### Check the control line to the exhaust turbocharger

- Detach the hose on the middle connection -arrow- in -I- of the charge pressure control solenoid valve - N75- and on the vacuum setting element of the exhaust gas turbocharger -arrow- in -II-.
- Close one opening of the hose with a suitable dummy plug.



### Note

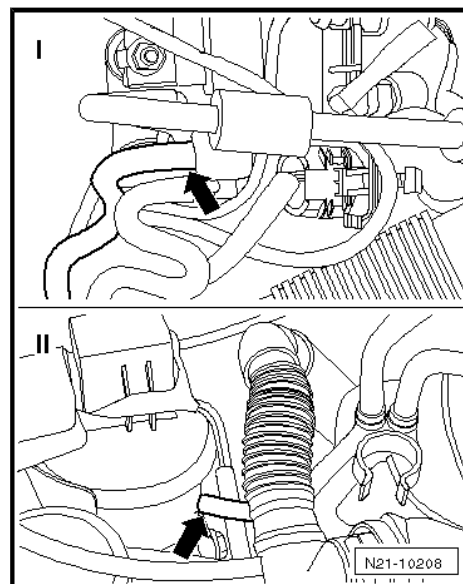
*Do not use any thread screws or thread bolts.*

- Attach the hand vacuum pump - VAS 6213- to the other end of the hose and generate a vacuum of 0.06 MPa (0.6 bar).
- Observe the pressure gauge of the hand vacuum pump for approx. 30 seconds.
- The vacuum must not drop.

If the vacuum drops:

- Replace vacuum hose.

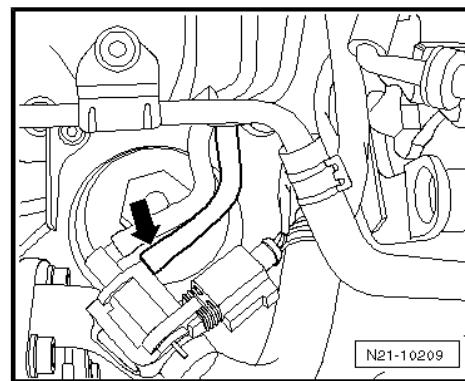
**Check the control line to the vacuum setting element for switching over the radiator for the exhaust gas recirculation:**



- Detach the hose on the middle connection of the exhaust gas recirculation radiator change-over valve - N345- -arrow-.
- Attach the hand vacuum pump - VAS 6213- to the detached hose and generate a vacuum of 0.06 MPa (0.6 bar).
- Observe the pressure gauge of the hand vacuum pump for approx. 30 seconds.
- The vacuum must not drop.

If pressure drops:

- Detach the vacuum hose on the vacuum setting element for switching over the radiator for exhaust gas recirculation.
- Attach the hand vacuum pump - VAS 6213- with the factory-delivered test hose to the vacuum unit and generate a vacuum of 0.06 MPa (0.6 bar).



#### Note

- ◆ *The adjustment on the vacuum setting element must be noticeable and the vacuum must not drop. If this is not the case, replace the exhaust gas recirculation radiator*  
*⇒ "2.3 Removing and installing radiator for exhaust gas recirculation", page 332.*
- ◆ *If no defect can be found on the vacuum setting element, replace the vacuum line of the changeover valve for radiator of exhaust gas recirculation - N345-.*

## 1.6 Replacing and adjusting the vacuum setting element for exhaust turbocharger

### Special tools and workshop equipment required

- ◆ 10 mm wrench socket - T10422 A-
- ◆ Ring spanner 10 x 12 - T10423-
- ◆ Socket - T40055-
- ◆ Key - T10461-
- ◆ Thin paint brush (approx. 20 cm long)
- ◆ Hand vacuum pump , e.g. -VAS 6213-



#### Caution

*The special tools listed, in particular the socket wrench - T10422 A- , must be used exclusively as described below and must not be used for any other screwed connections. Risk of deformations, opening and slipping of the wrench at higher tightening torques.*



#### Note

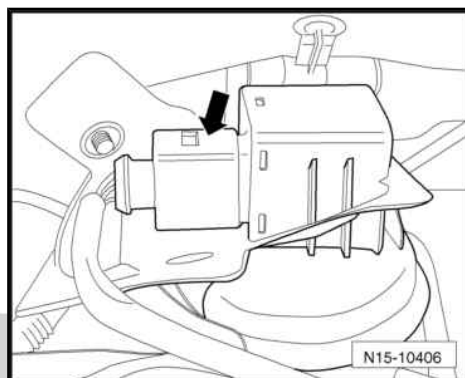
*In order to replace the vacuum setting element with the position sender for charge pressure regulator - G581- the spare part set is used ⇒ Electronic Catalogue of Original Parts .*



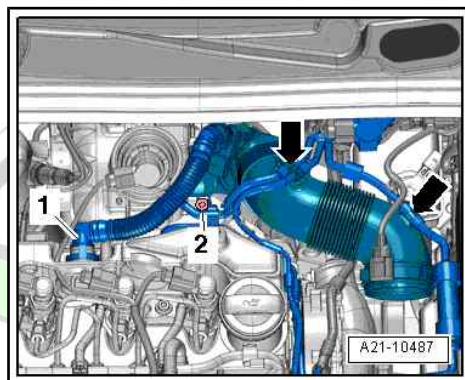


## Removing

- Remove cover and bulkhead plenum chamber ⇒ Body Work; Rep. gr. 66 .
- Remove the heat shield collar and disconnect the plug -arrow- on the position sender for charge pressure regulator - G581- .



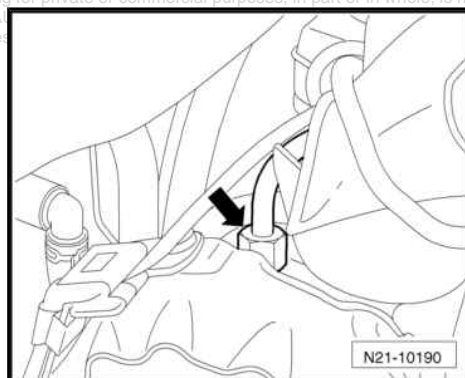
- Remove the connecting pipe -1- for the crankcase ventilation from the cylinder head cover, to do so press together the release buttons.
- Unclip vacuum hoses -arrows-.
- Release screw -2- (captive), swivel intake hose with connection fitting towards the rear and detach from exhaust gas turbocharger.
- Close the inlet opening of the exhaust gas turbocharger with a screw cap from the spare part set.
- Detach vacuum line from vacuum setting element for exhaust gas turbocharger.



### Caution

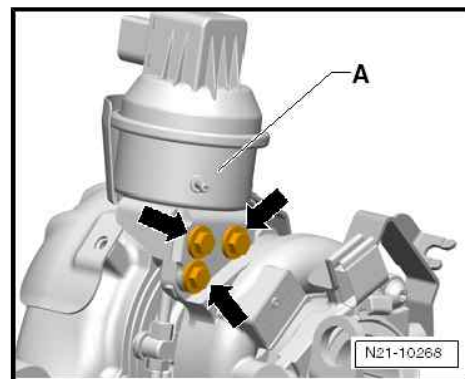
***When slackening the union nut of the oil feed line, it is absolutely essential to counterhold the connection fitting on the exhaust gas turbocharger with the wrench - T10461- .***

- Unscrew the union nut of the oil feed line -arrow-, to do so counterhold the connection fitting on the exhaust gas turbocharger with the wrench - T10461- .
- Close the opening of the connection fitting on the exhaust gas turbocharger with a plug from the spare part set.



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- Unscrew the fixing screws -arrows- and divert the vacuum setting element -A-.



- Counterhold the counternut -B- with ring spanner - T10423- and unscrew the adjusting nut -A- from the control rod with socket wrench - T10422- .

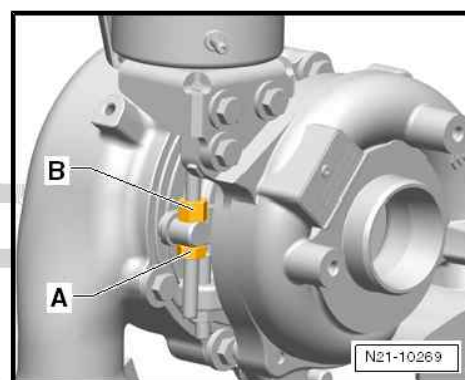
#### Installing



#### Caution

*Only use new screws and nuts from the spare part set.*

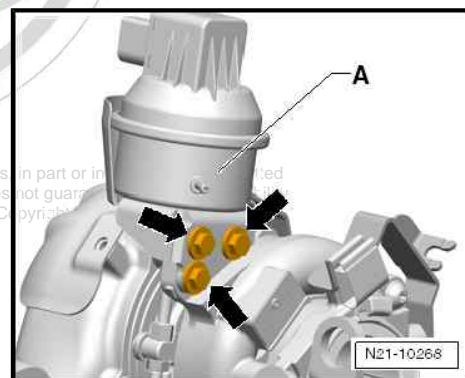
- If necessary, remove the bottom adjusting nut from the control rod of the new vacuum setting element.
- Screw the counternut onto the control rod of the new vacuum setting element by hand up to the thread end and pull the control rod through the opening of the operating lever on the exhaust gas turbocharger.



#### Note

*Ensure that the operating lever moves smoothly on the control rod.*

- Move the vacuum setting element -A- in its installed position and screw in fixing screws -arrows-.



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- Fit the plug on the position sender for charge pressure regulator - G581- -2- and close the heat shield collar.

#### Adjust the vacuum setting element for exhaust turbocharger

- Connect ⇒ Vehicle diagnostic tester and switch on ignition.

#### Select operating mode

- Press the button **vehicle self-diagnosis** on the screen.

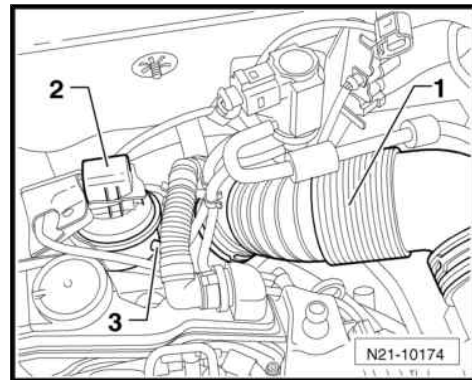
#### Select vehicle system

- Press the button **01 - Engine Electronics** on the screen.

The control unit identification and the coding of the engine control unit are indicated on the display.

#### Select diagnosis function

- Press the button **011 - Measured values** on the screen.
- Enter the measured value block “120” on the keypad and confirm the entry with the **Q** key.



#### Note

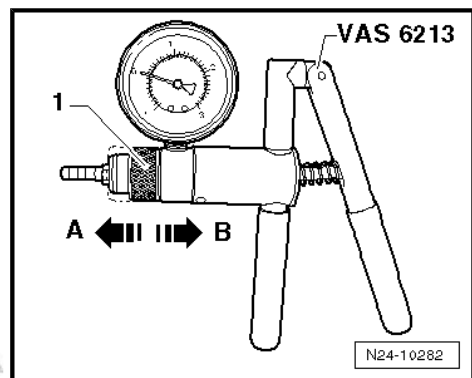
*In order to generate “vacuum”, push the ring -1- for the hand vacuum pump - VAS 6213- into position -A-.*

- Connect the hand vacuum pump - VAS 6213- to the connection of the vacuum setting element.
- Observe the lowest values of the measured value block and set the voltage to 0.760 V by building up vacuum.

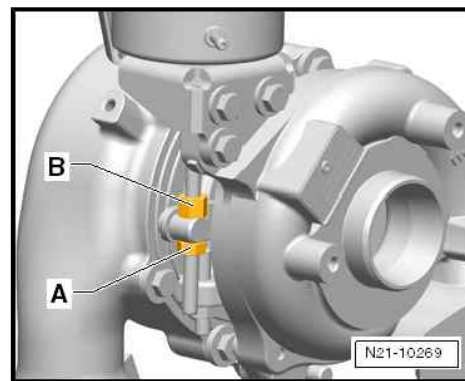


#### Caution

*During the following setting of the control rod, maintain a steady vacuum and thus also a constant voltage of 0.760 V.*



- Leave the operating lever in the position »bottom limit« and slowly continue to screw the counternut -B- on the control rod up to the cylinder by hand.
- Hold the counternut -B-, screw the adjusting nut -A- on the control rod opposite the operating lever and slightly tighten with the ring spanner - T10423- .
- Reduce the vacuum in the pressure box of the vacuum setting element.
- Observe the lowest values of the measured value block:
  - If depressurized, the following value must be set: 3.30-3.90 V
- Tighten the adjusting nut -A- with the socket wrench - T10422- ; to do so hold the counternut -B- with the ring spanner - T10423- .



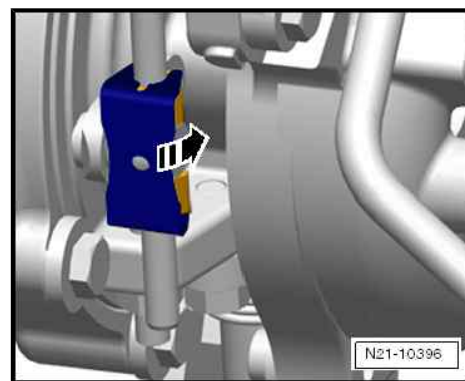
#### WARNING

**Generate a vacuum of  $0.75 \pm 0.05$  bar at the vacuum setting element to ensure that the operating lever is positioned on the "limit stop". For this purpose, a voltage of 0.760 V must be set.**

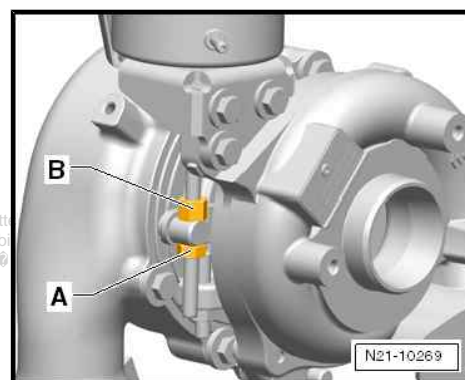
If the voltage value is o.k.

- Press the lock washer on the control rod by hand and turn it 90° in -direction of arrow-.
- Apply paint with a thin paint brush from the spare part set to seal the connection of the control rod/adjusting nut.

If the voltage value is not o.k.



- Hold the counternut -B-, slacken the adjusting nut -A- and correct the voltage value by turning the counternut -B-.
- Hold the counternut -B- and tighten the adjusting nut -A- with the socket insert - T10422- .



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- Press the lock washer on the control rod by hand and turn it 90° in -direction of arrow-.
- Apply paint with a thin paint brush from the spare part set to seal the connection of the control rod/adjusting nut.

### Finish the installation and check the adjustment

Further installation occurs in reverse order for removal, while paying attention to the following:

- Remove plug from connection fitting on the exhaust gas turbocharger and install oil feed line.
- Tighten the union nut with the socket wrench insert - T40055- to the specified tightening torque, while counterholding the connection fitting on the hexagon with key - T10461- .
- Remove the screw cap from the inlet opening of the exhaust gas turbocharger.
- Start engine and erase event memory ⇒ Vehicle diagnostic tester.
- Check the setting as follows:

### Select diagnosis function

- Press the button **006 - Basic setting** on the screen.
- Enter the measured value block "120" on the keypad and confirm the entry with the **Q** key.
- Press the button **Activation** on the screen.

Now the control rod of the vacuum setting element adjusts the operating lever of the exhaust gas turbocharger alternatively to both end positions.

- Observe the values of the position sender for charge pressure regulator - G581- in the bottom window of the screen:
  - The voltage must vary between 0.65 ... 0.85 V and 3.30 ... 3.90 V.

If the voltage values are o.k.:

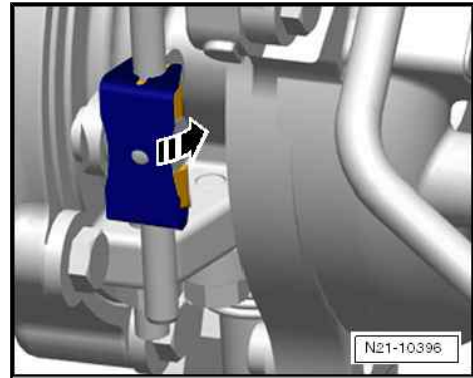
- Complete basic setting.

If the voltage values are not o.k.:

- Correct the setting ⇒ [page 253](#) .

### Tightening torques

- ◆ Screws of the vacuum setting element  
⇒ ["1.1 Summary of components - exhaust gas turbocharger with component parts", page 237](#)
- ◆ Oil feed line  
⇒ ["1.1 Summary of components - exhaust gas turbocharger with component parts", page 237](#)





## 2 Charge-air system - radiator, leak-tightness

⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#)

⇒ [“2.2 Summary of components - Charge air cooler Superb II”, page 256](#)

⇒ [“2.3 Summary of components - Charge air cooler Yeti”, page 257](#)

⇒ [“2.4 Removing and installing charge air cooler Octavia II, Yeti”, page 258](#)

⇒ [“2.5 Removing and installing Charge air cooler Superb II”, page 259](#)

⇒ [“2.6 Hose connections”, page 261](#)

⇒ [“2.7 Checking the charge-air system for leaktightness”, page 262](#)

⇒ [“2.8 Inspect vacuum setting element and tension rods for charge pressure control”, page 264](#)

### 2.1 Summary of components - Charge air cooler Octavia II



#### Note

*Observe general instructions for charge-air system*

⇒ [“2.6 General instructions for charge air system”, page 5](#).

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**1 - Screw**

- ☐ 5 Nm

**2 - Mounting bracket**

- ☐ Check fitting position

**3 - Charge air cooler**

- ☐ Removing and installing  
⇒ ["2.4 Removing and installing charge air cooler Octavia II, Yeti"](#),  
page 258

**4 - top seal**

- ☐ fitted onto charge air cooler

**5 - Right charge air hose**

**6 - Screw clamp**

- ☐ Tightening torque  
⇒ ["2.6.2 Hose connections with screw clamps"](#), page 262

**7 - to throttle valve control unit - J338-**

**8 - Charge pressure sender - G31- with intake air temperature sender - G42-**

**9 - Screw**

- ☐ 3 Nm

**10 - Rubber bowl**

- ☐ Replace if damaged.

**11 - Screw**

- ☐ 10 Nm

**12 - Right charge air pipe**

**13 - Connecting hose**

**14 - from exhaust turbocharger**

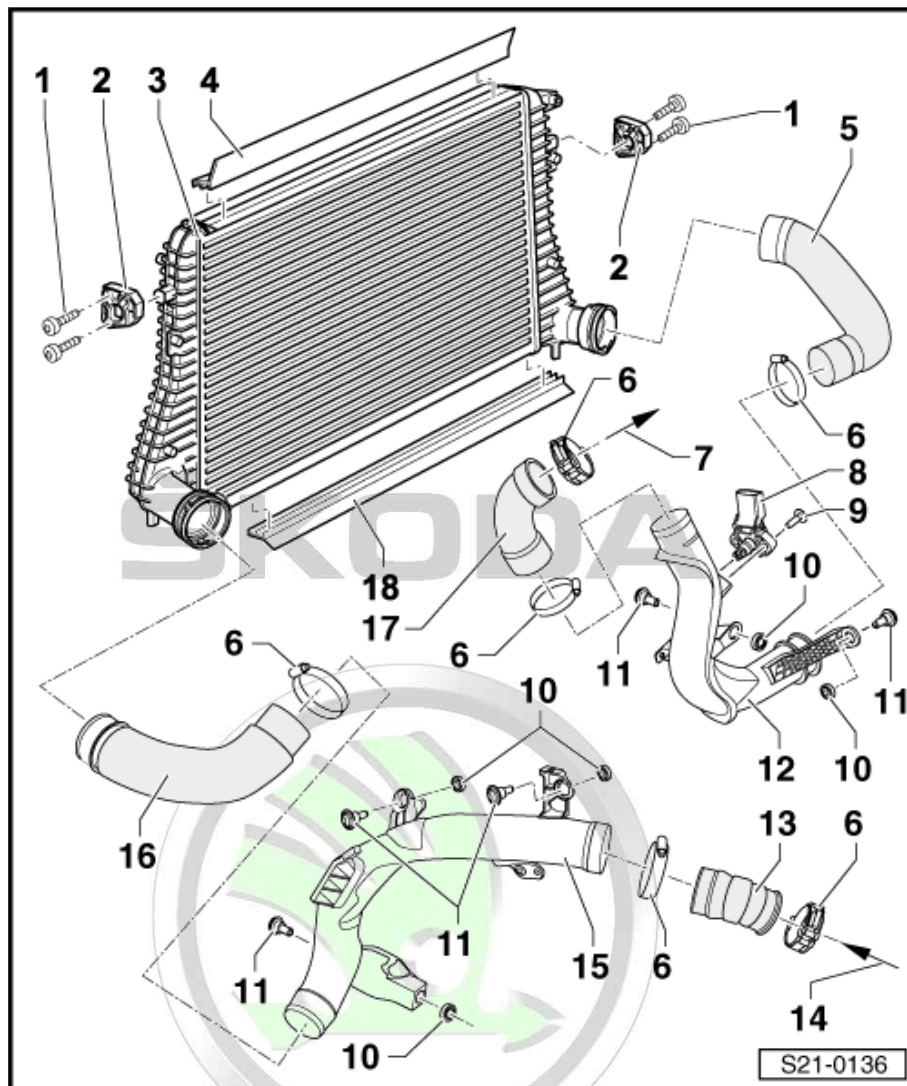
**15 - Left charge air pipe**

**16 - Left charge air hose**

**17 - Connecting hose**

**18 - bottom seal**

- ☐ fitted onto charge air cooler



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## 2.2 Summary of components - Charge air cooler Superb II



**Note**

Observe general instructions for charge-air system  
⇒ ["2.6 General instructions for charge air system"](#), page 5.

**1 - Screw**

- 5 Nm

**2 - Mounting bracket**

- Check fitting position

**3 - Charge air cooler**

- Removing and installing  
⇒ ["2.5 Removing and installing Charge air cooler Superb II", page 259](#)

**4 - Right charge air hose**

**5 - Screw clamp**

- Tightening torque  
⇒ ["2.6.2 Hose connections with screw clamps", page 262](#)

**6 - to throttle valve control unit - J338-**

**7 - Connecting hose**

**8 - Charge pressure sender - G31- with intake air temperature sender - G42-**

**9 - Screw**

- 3 Nm

**10 - Rubber bowl**

- Replace if damaged.

**11 - Screw**

- 10 Nm

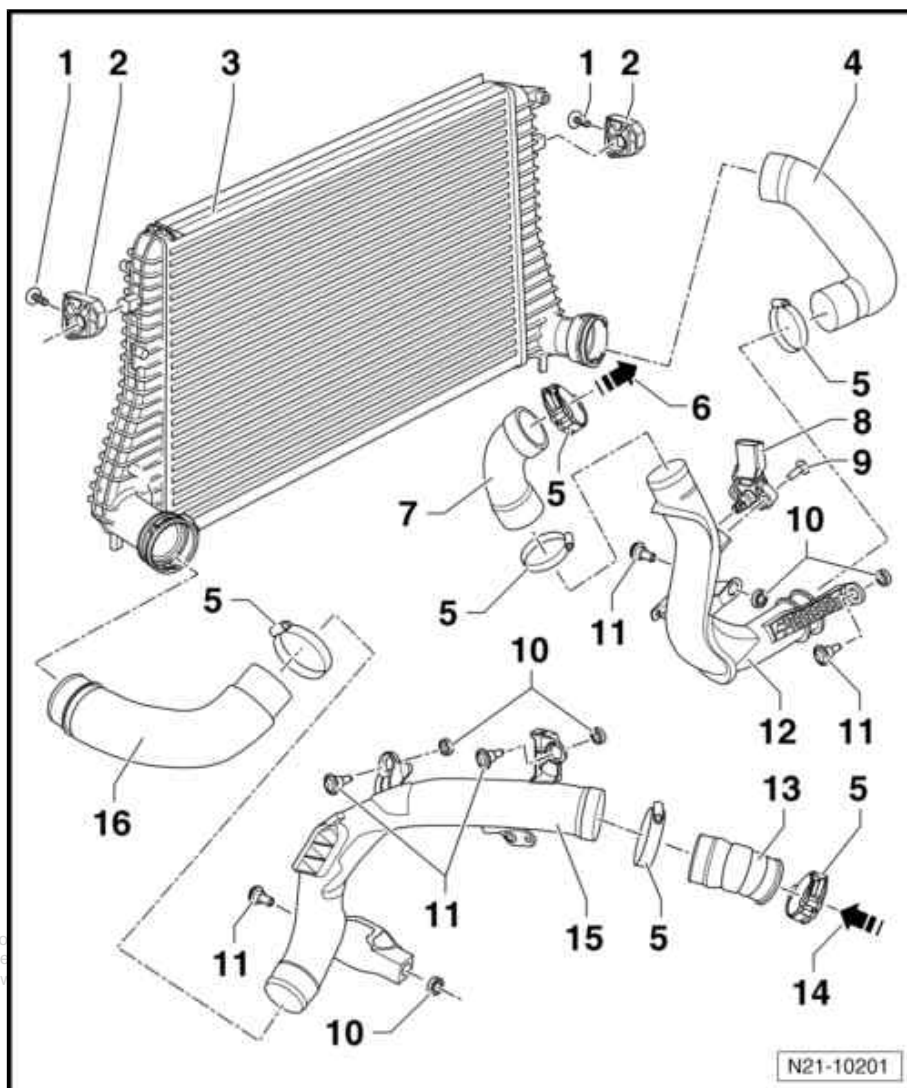
**12 - Right charge air pipe**

**13 - Connecting hose**

**14 - from exhaust turbocharger**

**15 - Left charge air pipe**

**16 - Left charge air hose**



## 2.3 Summary of components - Charge air cooler Yeti



**Note**

- ◆ *Observe general instructions for charge-air system  
⇒ ["2.6 General instructions for charge air system", page 5](#).*
- ◆ *Observe tightening torques of screw clamps for hose connections  
⇒ ["2.6.2 Hose connections with screw clamps", page 262](#).*



## 1 - Charge air cooler

- ❑ Removing and installing  
⇒ ["2.5 Removing and installing Charge air cooler Superb II", page 259](#)

## 2 - Right charge air hose

## 3 - Screw clamp

- ❑ Tightening torque  
⇒ ["2.6.2 Hose connections with screw clamps", page 262](#)

## 4 - to throttle valve control unit - J338-

## 5 - Connecting hose

## 6 - Screw

- ❑ 3 Nm

## 7 - Charge pressure sender - G31- with intake air temperature sender - G42-

## 8 - Rubber bowl

- ❑ Replace if damaged.

## 9 - Screw

- ❑ 10 Nm

## 10 - Right charge air pipe

## 11 - Connecting hose

## 12 - from exhaust turbocharger

## 13 - Left charge air pipe

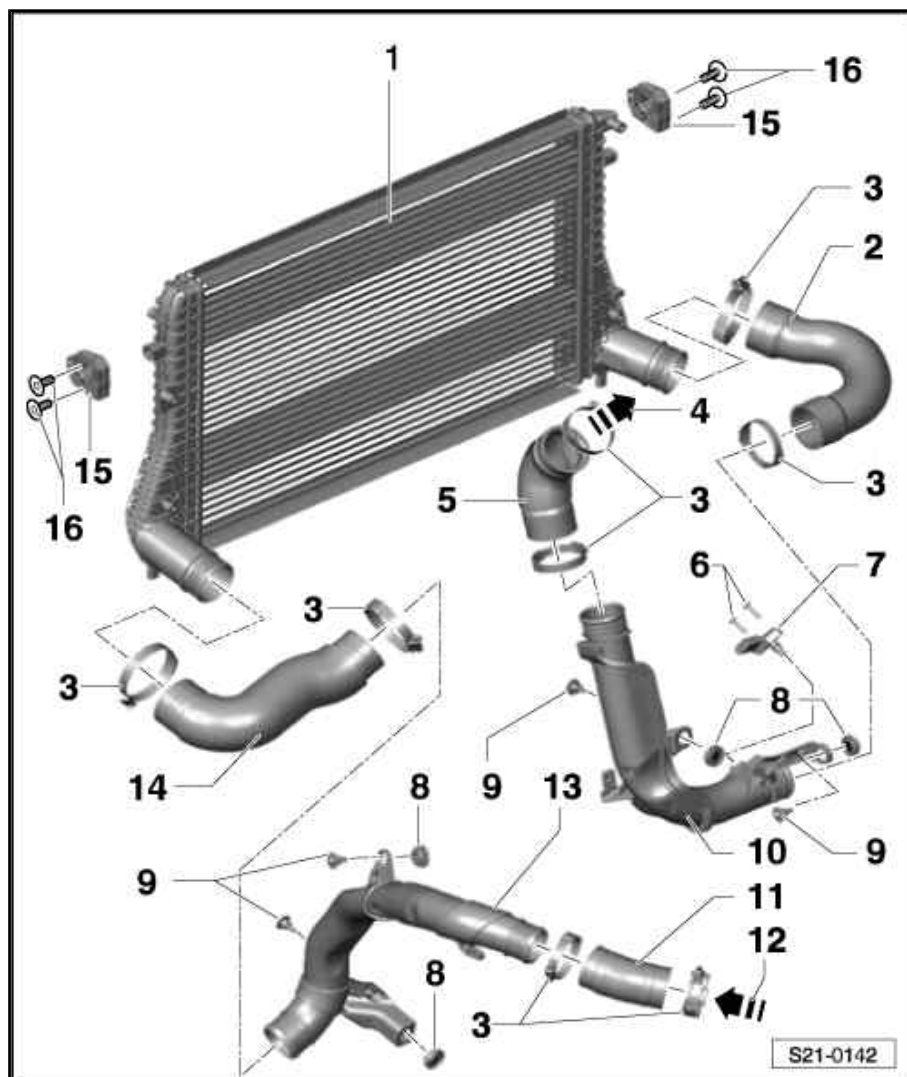
## 14 - Left charge air hose

## 15 - Mounting bracket

- ❑ Check fitting position

## 16 - Screw

- ❑ 5 Nm



## 2.4 Removing and installing charge air cooler Octavia II, Yeti

### Removing

- Remove coolant radiator  
⇒ ["4.3 Removing and installing radiator", page 189](#) .

### For the vehicles Octavia II

- Remove front bumper ⇒ Body Work; Rep. gr. 63 .

### For the vehicles Yeti

- Remove battery tray ⇒ Electrical System; Rep. gr. 94 .

### For all vehicles

- Remove the charge air hoses on the left and right from the charge air cooler.



For vehicles with air conditioning



**WARNING**

*Do not open the refrigerant circuit of the air conditioning system.*



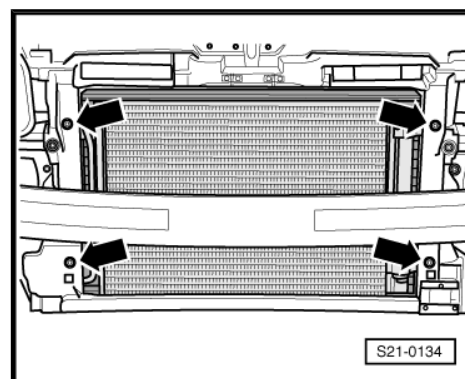
**Caution**

*To prevent damage to condenser or to refrigerant lines/hoses, ensure that the lines and hoses are not stretched, kinked or bent.*

- Release the securing bolts -arrows- of the condenser.

**For all vehicles**

- Unscrew fixing screws for charge air cooler on right and left side:
- ♦ Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#) , Pos. -1-.
- ♦ Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”, page 257](#) , Pos. -16-.



**For vehicles with air conditioning**

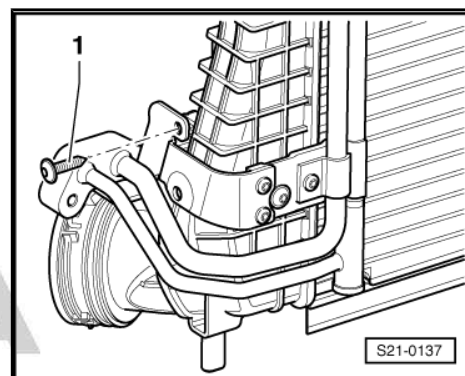
- Press off the charge air cooler from the lock carrier with the assistance of a 2nd mechanic so that the screw -1- for attaching the pipes of the air conditioning system to the radiator is accessible.
- Release screw -1-.

**For all vehicles**

- Carefully remove charge air cooler downwards.

**Installing**

Installation is carried out in the reverse order. When installing, observe the following:



**Note**

- ♦ Replace O-rings.
- ♦ Observe the assembly instruction for hose connections with push-fit couplings ⇒ [“2.6 Hose connections”, page 261](#) .

## 2.5 Removing and installing Charge air cooler Superb II

**Removing**

- Remove coolant radiator  
⇒ [“4.3 Removing and installing radiator”, page 189](#) .
- Remove front bumper ⇒ Body Work; Rep. gr. 63 .
- Remove the charge air hoses on the left and right from the charge air cooler.





- Release screws -1- at charge air cooler.



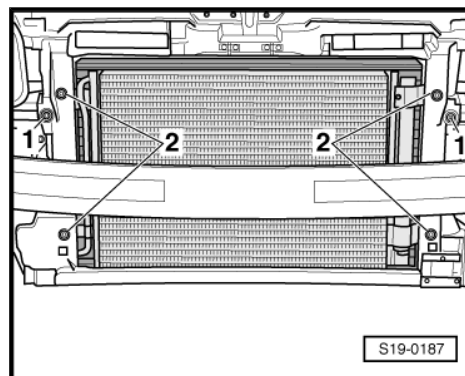
### WARNING

*Do not open the refrigerant circuit of the air conditioning system.*



### Caution

*To prevent damage to condenser or to refrigerant lines/hoses, ensure that the lines and hoses are not stretched, kinked or bent.*



### Note

*For the following operations a second mechanic is required to hold the charge air cooler.*

- Swivel the charge air cooler towards the rear, remove the lateral bearings and unhook out of the lower bearings.
- Release the securing bolts -arrows- of the condenser.
- Remove charge air cooler downwards.

### Installing

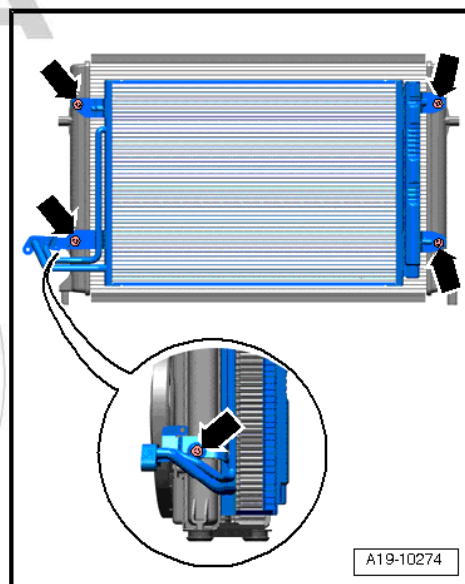
Assembly is carried out in the reverse order. When installing, observe the following:



### Note

*Replace O-rings.*

- Observe the assembly instruction for hose connections with push-fit couplings ⇒ ["2.6 Hose connections", page 261](#) .



## 2.6 Hose connections

⇒ [“2.6.1 Assembly of hose connections with push-fit couplings”, page 261](#)

⇒ [“2.6.2 Hose connections with screw clamps”, page 262](#)

⇒ [“2.6.3 Hose connections with spring strap ring”, page 262](#)

### 2.6.1 Assembly of hose connections with push-fit couplings



#### Caution

*The gasket ring for the quick coupling can be damaged, if the securing clamp is in the lock position during the assembly. The connection would leak. Observe the assembly instruction.*

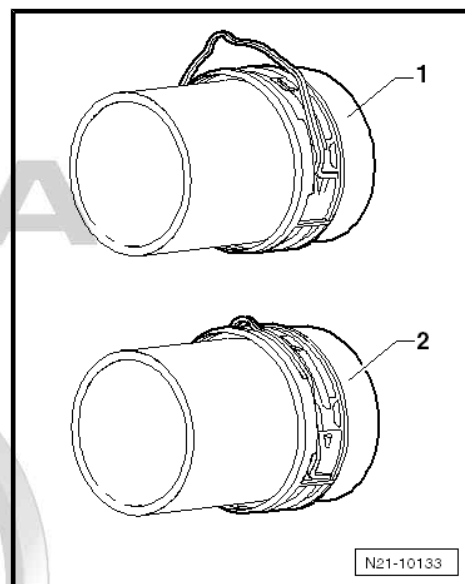
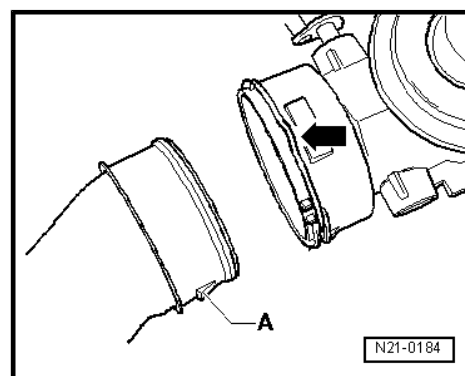
#### Removing

- Release the push-fit coupling by pulling the securing clamp -arrow-. Disconnect hose/pipe without auxiliary tool.

#### Installing

- When replacing the sealing ring, place the sealing ring in the groove of the charge air hose. Make sure that the gasket ring is placed all around in the groove and is not twisted.
- Oil the sealing surface and the sealing ring.

- Move the securing clamp to -unlocked- position -1-.
- Insert the charge air hose up to the stop into the coupling.
- Move the securing clamp in the -locked- position -2- and then once again press on the charge air hose.
- Check hose for tight connection by pulling on it and check the quick coupling is locked correctly.



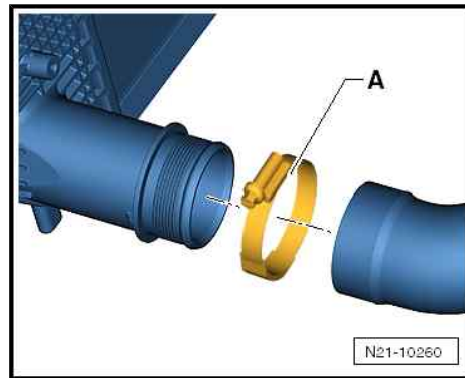


## 2.6.2 Hose connections with screw clamps



### Note

- ◆ *Connections, charge air pipes and hoses of charge air system must be free of oil and grease before being installed.*
- ◆ *Only install approved screw clamps for securing the hose connections ⇒ ETKA - Electronic Catalogue of Original Parts .*
- ◆ *In order to secure the charge air hoses on their connection fittings, the threads must be treated with rust solvent if the screw clamps have been used beforehand.*
- ◆ *After a repair, check all the charge air pipes, charge air hoses and vacuum lines for tight connection and leaks.*



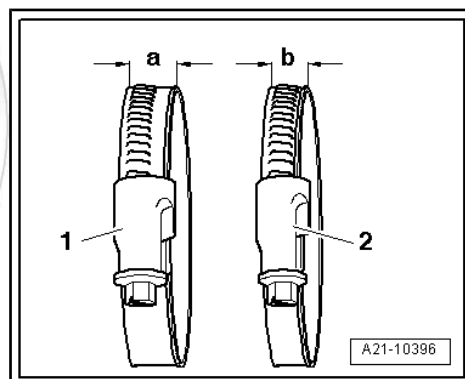
### Caution

**The screw clamps -A- on the charge air hoses must definitely be precisely tightened in accordance with the specifications ⇒ [page 262](#) .**

- ◆ **A too low or on the contrary, a too high tightening torque of the screw clamps, may result in the charge air hose slipping off the fluted pipe or the charge air pipe while driving.**

### Tightening torques of screw clamps

- 1 - Screw clamp -a- = 12 mm wide: 5.5 Nm
- 2 - Screw clamp -b- = 9 mm wide: 3 Nm



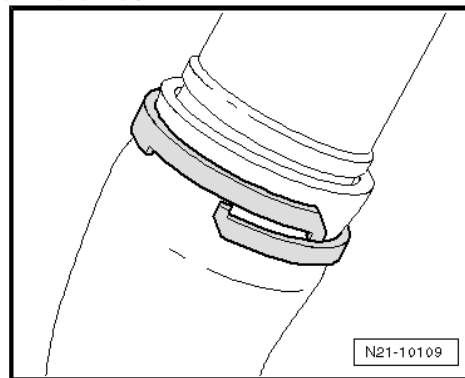
## 2.6.3 Hose connections with spring strap ring

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### Note

*After disassembling and assembling the charge air hoses with spring strap clamps, there is a risk of the "hose slipping off" when driving. For this reason, spring strap rings are installed, which can only be opened when there is a defect of the relevant charge air hose. When carrying out repairs, the spring strap ring must be destroyed using a suitable tool and replaced by a spare part according to the ⇒ ETKA - Electronic Catalogue of Original Parts .*



## 2.7 Checking the charge-air system for leaktightness

**Special tools and workshop equipment required**

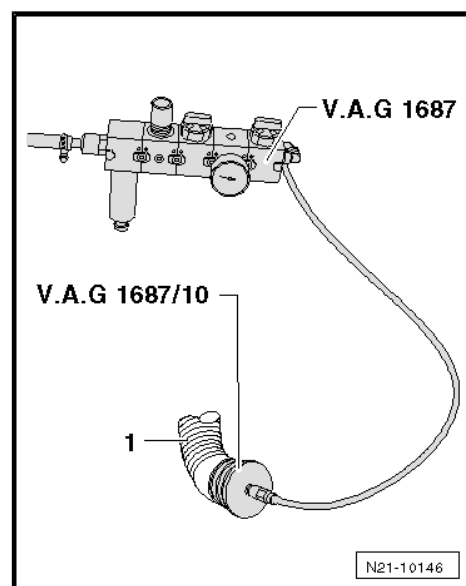
◆ Charge-air system testing device , e. g. -V.A.G 1687-

◆ Adapter , e.g. -V.A.G 1687/10-

### Test sequence

- Remove the intake hose -1- from the air filter housing.
- Fit adapter - 1687/10- into the intake hose -1- and secure with a hose clamp.

Prepare tester for charge air system - V.A.G 1687- as follows:

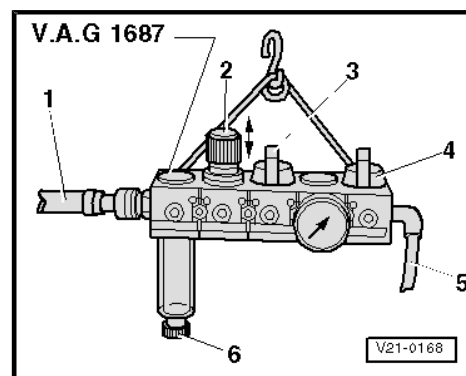


- Unscrew pressure control valve -2- fully and close the valves -3- and -4-.

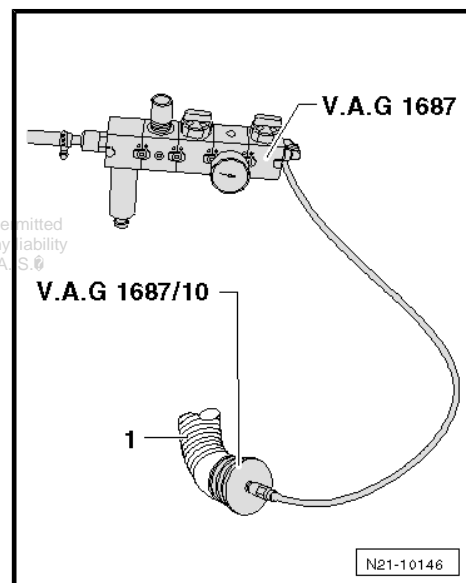


### Note

*The rotary knob must be pulled to the top in order to rotate the pressure control valve -2-.*



- Connect tester for charge air system - V.A.G 1687- as shown to adapter - 1687/10- .



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- Connect the pneumatic hose -1- (pneumatic support) at tester.



#### Note

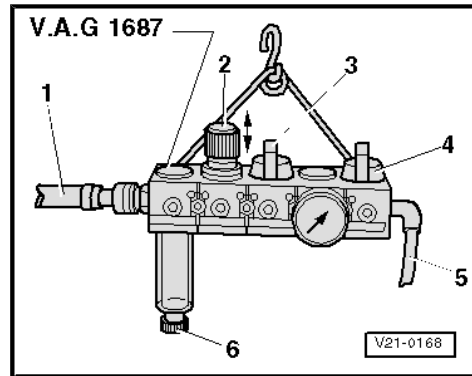
*If there is water in the transparent drain container, drain water via the drain plug -6-.*

- Open valve -3-.
- Set the pressure to 0.05 MPa (0.5 bar) with the pressure control valve -2-.



#### Caution

***The pressure must not be greater than 0.05 MPa (0.5 bar)! A too high pressure can damage the engine.***



- Open valve -4- and wait until the test circuit is filled. If necessary, re-adjust the pressure to 0.05 MPa (0.5 bar).
- Check the charge air system for leaks by means of a visual inspection, listening, feeling with the ultrasound measuring device, e. g. -V.A.G 1842-, where appropriate, with a commercially available leak detection spray.



#### Note

- ♦ *Minor leaks are permissible on the suction side of the turbo-charger, because the intake hoses are not designed for over-pressure.*
- ♦ *A small amount of air penetrates via the inlet valves into the engine. For this reason no pressure test is possible.*
- ♦ *Using the ultrasonic tester - V.A.G 1842- → Operating instructions .*
- ♦ *In case of a leak point, observe the instructions for charge air system  
⇒ **"2.6 General instructions for charge air system", page 5** during the installation.*
- ♦ *Before removing the adapter - 1687/10- by loosening the hose clamp, release the pressure in the test circuit.*

## 2.8 Inspect vacuum setting element and tension rods for charge pressure control

### Special tools and workshop equipment required

- ♦ Hand vacuum pump , e.g. -VAS 6213-

Faults at tension rods or at vacuum setting element of charge pressure control lead to the following faults:

- ♦ Specified values for charge pressure are not reached.
- ♦ Poor performance.
- ♦ Irregular performance in the partial load region.
- ♦ Engine jerk in change-over.

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## Test sequence

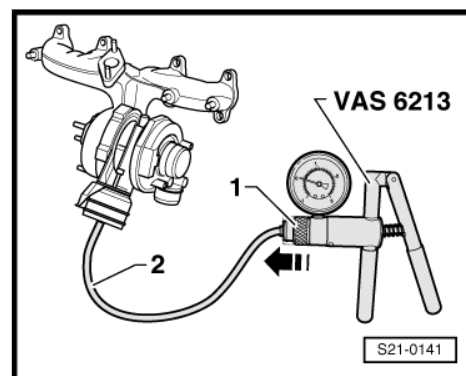
- Vacuum hosing checked  
⇒ ["1.4 Connection diagram for vacuum hoses", page 246](#) .
- Charge-air system was checked for tightness  
⇒ ["2.7 Checking the charge-air system for leaktightness", page 262](#) .
- Remove engine cover  
⇒ ["1.1 Removing and installing engine trim panel", page 7](#) .
- Connect the connecting hose -2- to the vacuum setting element and to the hand vacuum pump - VAS 6213- .
- Slide the sliding ring -1- of the hand vacuum pump - VAS 6213- in the -direction of arrow- for "vacuum".



### Note

For the following test a second mechanic is required.

- Generate vacuum with the hand vacuum pump - VAS 6213- and observe the tension rod of exhaust turbocharger.



### Note

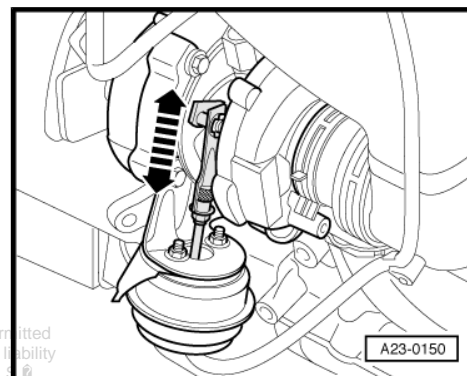
For the inspection use a mirror.

## Nominal values:

- At a vacuum of 0.005...0.012 MPa (0.05...0.120 bar) the tension rod must move up.
- At a vacuum of 0.055...0.062 MPa (0.550...0.620 bar) the tension rod must rest at the top against the stop.
- Remove the connecting hose from the hand vacuum pump - VAS 6213- and at the same time observe the tension rod over the entire adjustment range.
- The tension rod must move without jolting over the entire adjustment range.

If the specified values are not achieved or the tension rod moves with jolt:

- Replace exhaust turbocharger  
⇒ ["1.2 Removing and installing exhaust gas turbocharger", page 240](#) .



### Note

- ◆ If the measuring accuracy of the vacuum using the hand vacuum pump - VAS 6213- is not adequate, the turbocharger tester, e.g. -V.A.G 1397 A-, can be used for a more precise measurement.
- ◆ Connection of the turbocharger tester ⇒ Operating instructions .



## 23 – Mixture preparation - injection

### 1 Diesel direct injection system - fitting location, system overview

⇒ [“1.1 Installation location overview”, page 266](#)

⇒ [“1.2 System overview”, page 268](#)

⇒ [“1.3 Removing and installing the engine speed sender G28”, page 269](#)

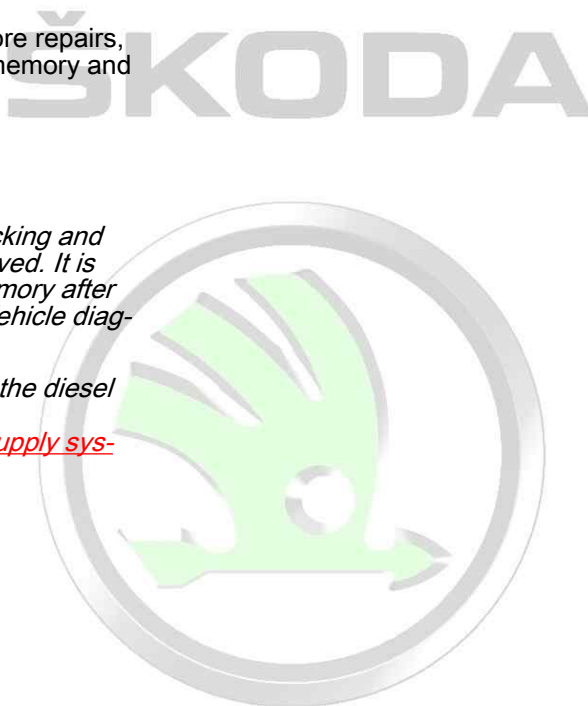
The control unit is equipped with event memory. Before repairs, setting operations and fault finding, query the event memory and run self-diagnosis ⇒ Vehicle diagnostic tester.



#### Note

- ◆ *Faults can be detected by the control unit as checking and adjustment work is being undertaken and then saved. It is therefore essential to always delete the event memory after completing all checking and adjustment work ⇒ Vehicle diagnostic tester.*
- ◆ *Observe the safety precautions when working on the diesel direct injection system*  
⇒ [“2.3 Safety precautions when working on fuel supply system”, page 3](#).

#### 1.1 Installation location overview



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1 - Exhaust gas pressure sensor 1 - G450-

2 - Hall sender - G40-

3 - Lambda probe - G39-

4 - Engine control unit - J623-

5 - Injection units

6 - Position transmitter for charge pressure regulator - G581-

7 - Pressure holding valve in the fuel return-flow line

8 - Control valve for fuel pressure - N276-

9 - Solenoid valve for charge pressure control - N75-

10 - Connector

- ☐ Exhaust gas temperature sender 4 - G648-
- ☐ for exhaust gas temperature sender 1 - G235- (Temperature sender upstream turbocharger - G507- )
- ☐ Lambda probe - G39-

11 - Air mass meter - G70-

12 - Coolant temperature sender - G62-

13 - engine speed sender - G28-

14 - Intake manifold flap motor - V157-

- ☐ with installed potentiometer - G336-

15 - Changeover valve for radiator of exhaust gas recirculation - N345-

16 - Coolant recirculation pump 2 - V178-

17 - Throttle valve control unit - J338-

- ☐ with installed potentiometer - G69-

18 - Charge pressure sender - G31-

19 - Glow plugs

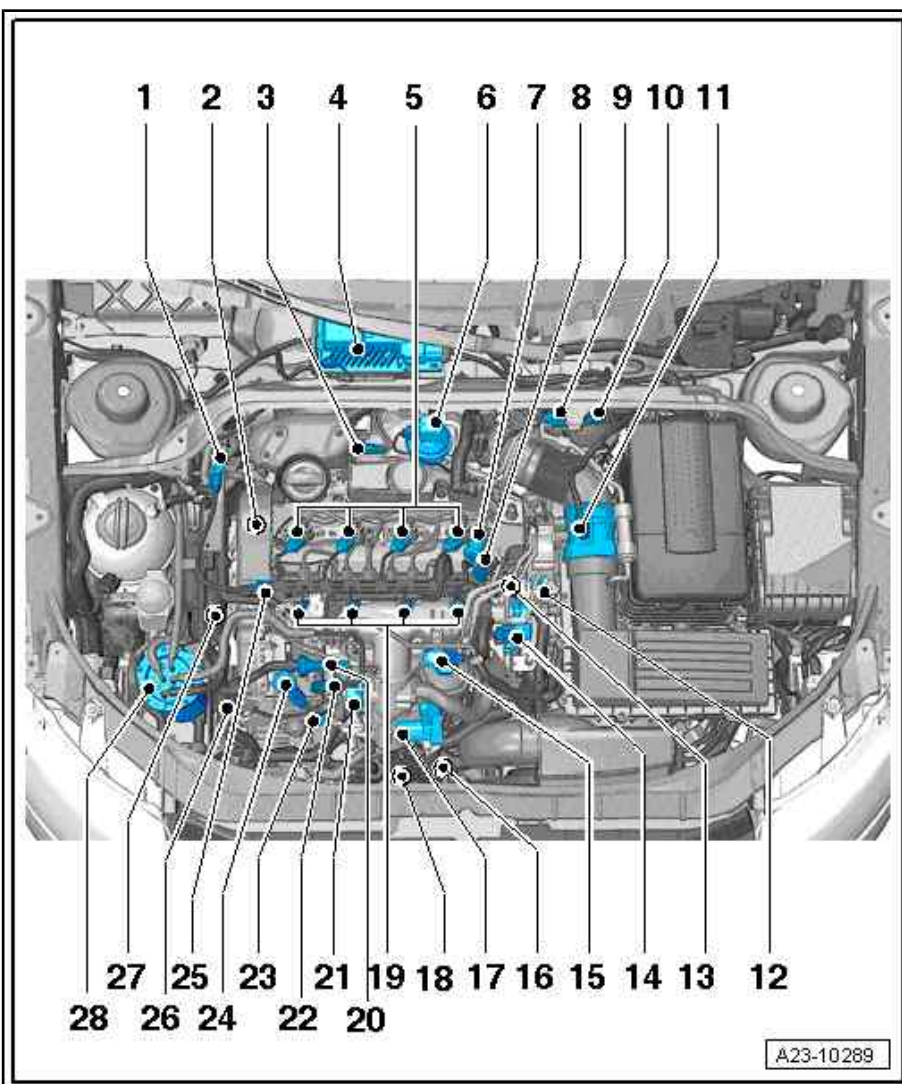
- ☐ Glow plug 1 - Q10-
- ☐ Glow plug 2 - Q11-
- ☐ Glow plug 3 - Q12-
- ☐ Glow plug 4 - Q13-

20 - Fuel temperature sender - G81-

21 - Exhaust gas return valve - N18-

- ☐ consists of:

- ◆ mechanical valve (electrically operated)
- ◆ Exhaust gas recirculation control motor - V338-
- ◆ Exhaust gas recirculation potentiometer - G212-



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## 22 - Connection for fuel feed line

- ☐ from fuel filter

## 23 - Connection for high pressure fuel feed line

- ☐ to fuel high pressure reservoir

## 24 - High pressure pump with fuel dosage valve - N290-

## 25 - Fuel pressure sender - G247-

## 26 - Coolant temperature sender at radiator outlet - G83-

## 27 - Additional fuel pump - V393-

## 28 - Fuel filter

## 1.2 System overview



### WARNING

*Absolutely observe the safety precautions when working on the diesel direct injection system*  
⇒ *"2.3 Safety precautions when working on fuel supply system", page 3*.

## 1 - Fuel dosage valve - N290-

- ☐ do not open

## 2 - High pressure pump



### Caution

*Risk of damage to the high pressure pump from running dry.*  
*After installing a new high pressure pump, the high pressure pump must be filled up with fuel before the first engine start.*  
*Avoid the high pressure pump to run dry.*

- ☐ Removing and installing  
⇒ *"2.8 Removing and installing the high pressure pump", page 287*

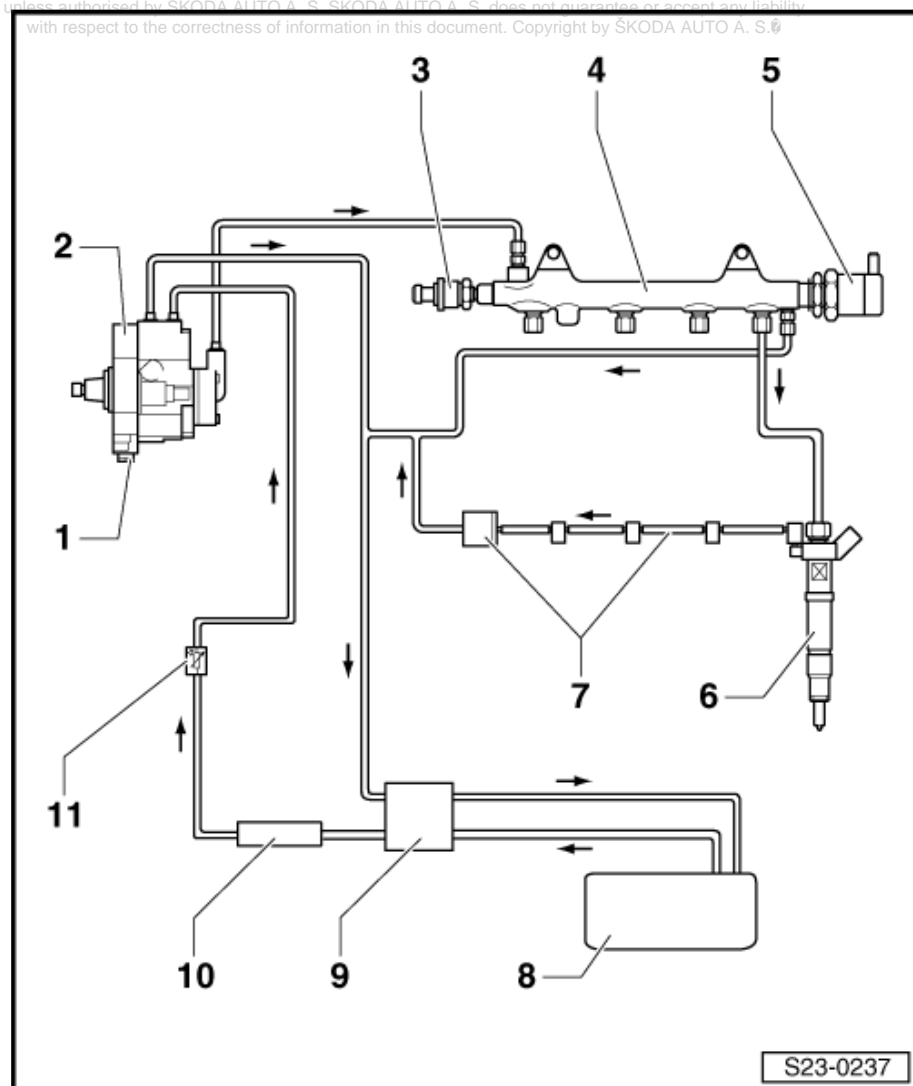
## 3 - Fuel pressure sender - G247-

- ☐ Removing and installing  
⇒ *"2.7 Removing and installing fuel pressure sender G247", page 285*
- ☐ 100 Nm

## 4 - Fuel high pressure reservoir

- ☐ Removing and installing  
⇒ *"2.4 Removing and installing high fuel pressure accumulator", page 281*

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## 5 - Control valve for fuel pressure - N276-

- ☐ Removing and installing ⇒ [“2.6 Replace fuel pressure regulating valve N276 ”, page 284](#)
- ☐ Check ⇒ [“2.5 Check fuel pressure regulating valve N276 ”, page 283](#)
- ☐ 80 Nm

## 6 - Injection unit

- ☐ Removing and installing ⇒ [“2.3 Removing and installing the injection units”, page 276](#)
- ☐ Checking fuel return-flow volume  
⇒ [“2.14 Check the fuel return-flow line on the injection units”, page 297](#)

## 7 - Fuel return-flow line

- ☐ from the injection units
- ☐ with pressure holding valve approx. 1 MPa (10 bar)
- ☐ Check the pressure holding valve  
⇒ [“2.13 Check the pressure holding valve in the fuel return-flow line”, page 295](#) .

## 8 - Fuel tank

## 9 - Fuel filter

## 10 - Additional fuel pump - V393-

- ☐ Check fuel flow rate ⇒ [“2.11 Check the fuel flow rate of the fuel pump”, page 293](#)

## 11 - Filter housing with fuel temperature sender - G81-

# 1.3 Removing and installing the engine speed sender - G28-

### Special tools and workshop equipment required

- ◆ Hose clamps up to Ø 25 mm - MP7-602 (3094)-
- ◆ Assembly tool - T10118-
- ◆ Socket - T10370-

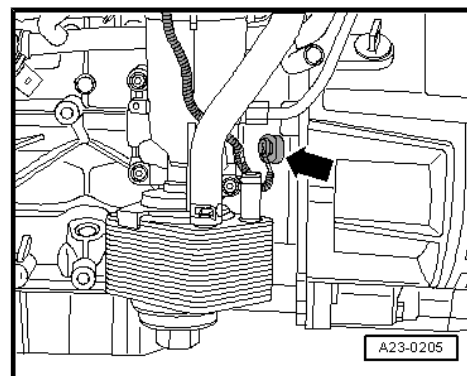
### Removing

- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .
- Unclip the coolant hoses at the engine oil cooler with hose clamps and remove the coolant hoses.
- Remove oil filter holder  
⇒ [“1.12 Removing and installing the oil filter holder with the engine oil cooler”, page 153](#) .
- Remove the plug -arrow- on the engine speed sender - G28- with the assembly device - T10118- and lay the electrical cable to the side.



### Note

*To unlock the plug without using the assembly device - T10118- , the unlock button must be pressed at the plug using a screwdriver and at the same time unlock the unlock button with a thin wire hook.*







- Unscrew the fixing screw -2- of the engine speed sender - G28- -1- and pull out the sender.

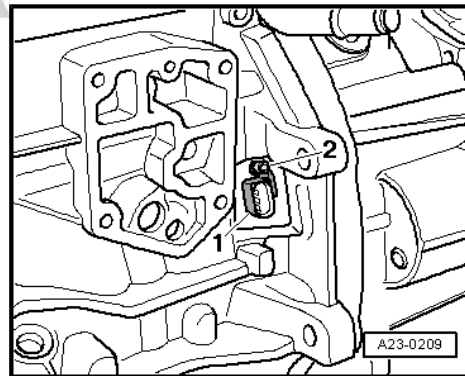
### Installing

Installation is carried out in the reverse order. When installing, observe the following:

- Install oil filter holder  
⇒ ["1.12 Removing and installing the oil filter holder with the engine oil cooler", page 153](#) .

### Tightening torques

- ♦ Engine speed sender - G28- to sealing flange  
⇒ ["2.4 Summary of components - gearbox side summary of components and flywheel", page 69](#)



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## 2 Fuel system, engine side

- ⇒ [“2.1 Assembly overview - fuel system”, page 271](#)
- ⇒ [“2.2 Adaptation for injector quantity adjustment \(IQA code\)”, page 275](#)
- ⇒ [“2.3 Removing and installing the injection units”, page 276](#)
- ⇒ [“2.4 Removing and installing high fuel pressure accumulator”, page 281](#)
- ⇒ [“2.5 Check fuel pressure regulating valve N276 ”, page 283](#)
- ⇒ [“2.5 Check fuel pressure regulating valve N276 ”, page 283](#)
- ⇒ [“2.6 Replace fuel pressure regulating valve N276 ”, page 284](#)
- ⇒ [“2.7 Removing and installing fuel pressure sender G247 ”, page 285](#)
- ⇒ [“2.8 Removing and installing the high pressure pump”, page 287](#)
- ⇒ [“2.9 Fill the high pressure pump with fuel and discharge the fuel system”, page 290](#)
- ⇒ [“2.10 Check the low pressure fuel system”, page 292](#)
- ⇒ [“2.11 Check the fuel flow rate of the fuel pump”, page 293](#)
- ⇒ [“2.12 Check the fuel system for tightness”, page 295](#)
- ⇒ [“2.13 Check the pressure holding valve in the fuel return-flow line”, page 295](#)
- ⇒ [“2.14 Check the fuel return-flow line on the injection units”, page 297](#)

### 2.1 Assembly overview - fuel system



#### Caution

*In order to avoid the high pressure pump to run dry and to achieve a quick engine start after parts are replaced, the following points must absolutely be observed:*

- ◆ *If the high pressure pump is removed, the basic setting “test of fuel pump for predelivery” must be carried out »3 times« before the first engine start.*
- ◆ *If the high pressure pump was replaced, the high pressure-pump must be filled with fuel before the first engine start*  
*⇒ [“2.9 Fill the high pressure pump with fuel and discharge the fuel system”, page 290](#) .*



## 1 - Fuel return-flow line

- ☐ from the injection units
- ☐ with pressure holding valve 1 MPa (10 bar)
- ☐ must not be kinked, damaged or blocked
- ☐ do not dismantle, the pressure holding valve must only be replaced complete with the fuel return-flow line ⇒ ETKA - Electronic Catalogue of Original Parts
- ☐ after an exchange, the engine must run at idling speed for approx. 2 minutes in order to vent the fuel system; afterwards check the fuel return-flow line for tightness
- ☐ Check the pressure holding valve  
⇒ **"2.13 Check the pressure holding valve in the fuel return-flow line", page 295**

## 2 - Screw

- ☐ 8 Nm

## 3 - Fuel return-flow line

## 4 - Fuel return-flow hose

- ☐ to fuel filter
- ☐ blue marking
- ☐ check for firm seating

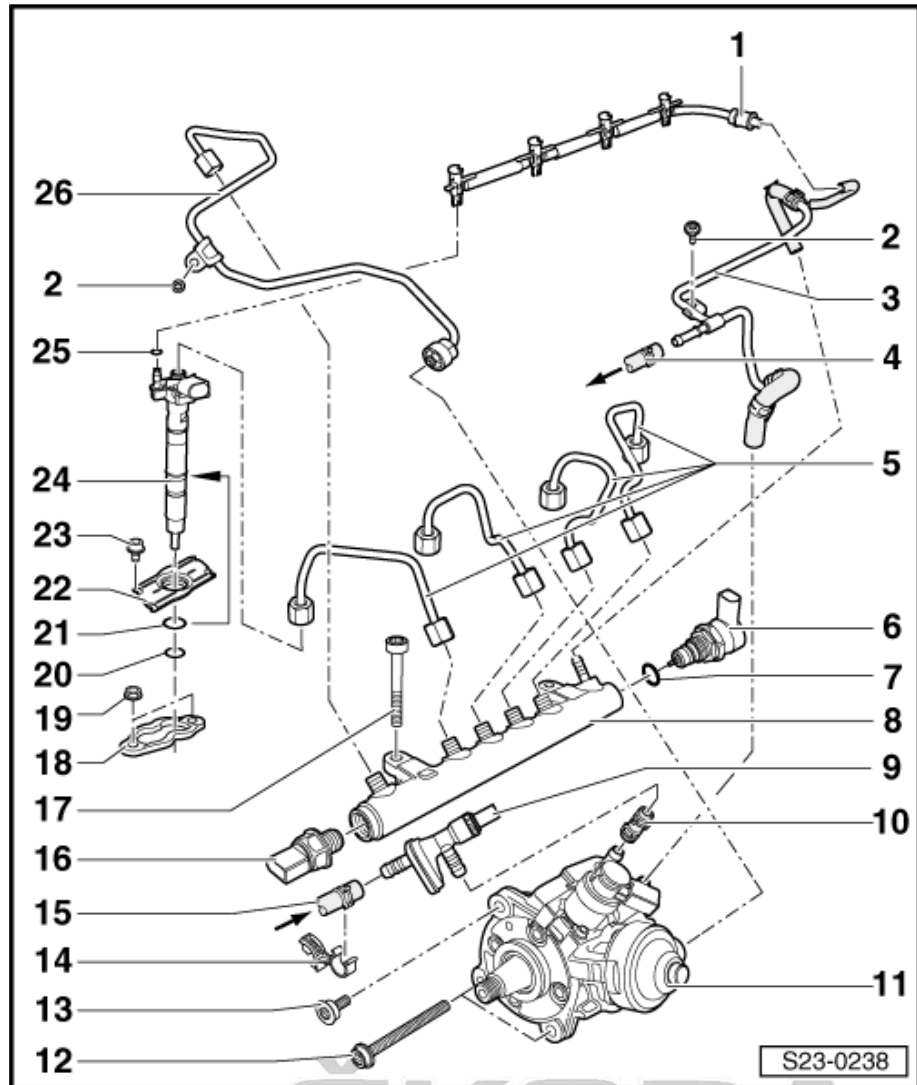
## 5 - High pressure lines

- ☐ between fuel high pressure reservoir and injection valves
- ☐ when installing a new injection unit, also replace the high pressure line
- ☐ do not exchange - when removing, mark
- ☐ when slackening the union nut at the injection unit, counterhold the connection fitting with a fixed spanner
- ☐ do not change bending form
- ☐ do not install under tension
- ☐ Tighten union nuts in one work step without time delay between tightening and torquing angle (max. 1 min)
- ☐ first of all tighten the union nut on the side of the injection unit
- ☐ 15 Nm + 60° further



### Note

- ◆ Pay attention to the cylinder specific marking when re-using the high pressure lines.
- ◆ The high pressure lines can be re-used after the following tests:
- ◆ Check the sealing cones and the union nuts for damage, deformations and tears.



- ◆ *The inner line boring must not be deformed, constricted or damaged.*
- ◆ *The corroded injection lines must not be re-used.*

#### 6 - Control valve for fuel pressure - N276-

- ☐ cannot be re-used, replace after removal
- ☐ Check ⇒ ["2.5 Check fuel pressure regulating valve N276", page 283](#)
- ☐ Replace ⇒ ["2.6 Replace fuel pressure regulating valve N276", page 284](#)
- ☐ 80 Nm

#### 7 - O-ring

- ☐ Replace after removal

#### 8 - Fuel high pressure reservoir

- ☐ Tighten the fixing screws Pos. -17- only after tightening the union nuts for the high pressure lines Pos. -5- and the union nuts of the high pressure line Pos. -26-
- ☐ Removing and installing ⇒ ["2.4 Removing and installing high fuel pressure accumulator", page 281](#)

#### 9 - Filter housing with fuel temperature sender - G81-

- ☐ Do not unscrew the fuel temperature sender - G81- , only replace completely
- ☐ if the fuel temperature sender - G81- was inadvertently slackened, it must be tightened again to 2.5 Nm

#### 10 - Fuel intake hose

- ☐ from fuel filter
- ☐ white marking
- ☐ check correct fitting

#### 11 - High pressure pump

- ☐ with fuel dosage valve - N290- (do not open)
- ☐ Removing and installing ⇒ ["2.8 Removing and installing the high pressure pump", page 287](#)
- ☐ an initial fuel filling must be carried out after the replacement (absolutely avoid it to run dry)  
⇒ ["2.9 Fill the high pressure pump with fuel and discharge the fuel system", page 290](#)

#### 12 - Screw

- ☐ Replace after removal
- ☐ 20 Nm + 180°

#### 13 - Screw

- ☐ Replace after removal
- ☐ 20 Nm + 45°

#### 14 - Mounting bracket

- ☐ Fuel temperature sender - G81-

#### 15 - Fuel intake hose

- ☐ white marking
- ☐ check for firm seating
- ☐ in front of the additional fuel pump - V393-

#### 16 - Fuel pressure sender - G247-

- ☐ Removing and installing ⇒ ["2.7 Removing and installing fuel pressure sender G247", page 285](#)
- ☐ 100 Nm



### Caution

*Do not slacken or tighten the fuel pressure sender using the open-end wrench or the open ring spanner - Risk of damage!*

*Use lengthened socket insert.*

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## 17 - Screw

- ☐ 22 Nm

## 18 - Clamping claw

- ☐ Replace after removal
- ☐ Check fitting position ⇒ [page 275](#)

## 19 - Nut

- ☐ 10 Nm

## 20 - Copper seal

- ☐ Replace after removal

## 21 - O-ring

- ☐ for gasket of hole for injection unit in cylinder head
- ☐ Replace after removal

## 22 - Cover for injection unit

## 23 - Screw

- ☐ 5 Nm

## 24 - Injection unit

- ☐ do not exchange - when removing, mark the fitting position
- ☐ when slackening the union nut for the high pressure line, counterhold the connection fitting with a fixed spanner
- ☐ when installing, the following must be replaced each time: copper seals of injectors, O-rings for bores of injection valve heads, O-rings for connections of fuel return-flow line and the clamping claws
- ☐ when installing a new injection unit, also replace the high pressure line Pos. -5-
- ☐ Removing and installing ⇒ ["2.3 Removing and installing the injection units", page 276](#)
- ☐ when replacing, the adaptation according to the code "injector quantity adjustment IQA" must also be carried out ⇒ ["2.2 Adaptation for injector quantity adjustment \(IQA code\)", page 275](#)

## 25 - O-ring

- ☐ for return-flow line
- ☐ Replace after removal

## 26 - High pressure line

- ☐ between high pressure pump and fuel high pressure reservoir
- ☐ do not install under tension
- ☐ Tighten union nuts in one work step without time delay between tightening and torquing angle (max. 1 min)
- ☐ first of all tighten the union nut on the side of the high pressure pump
- ☐ Tighten the retaining clip Pos. -2- only after tightening both union nuts
- ☐ 15 Nm + 60° further

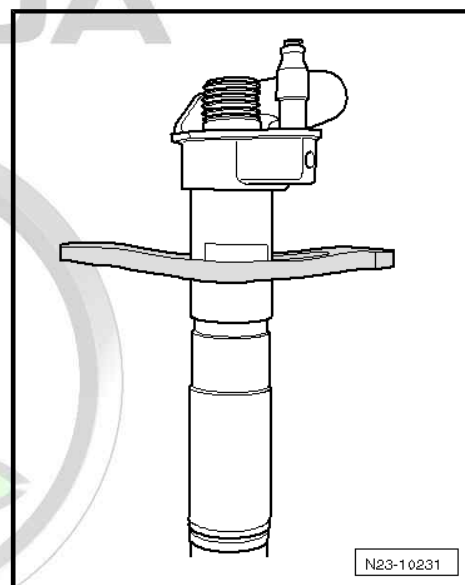




#### Note

- ◆ *The high pressure line can be re-used after the following tests:*
- ◆ *Check the sealing cones and the union nuts for damage, deformations and tears.*
- ◆ *The inner line boring must not be deformed, constricted or damaged.*
- ◆ *A corroded high pressure line must not be reinstalled.*

Fitting position of the clamping claw



## 2.2 Adaptation for injector quantity adjustment (IQA code)

The function "injector quantity adjustment (IQA)" of the engine control unit with the Common Rail system is used to correct the injection rate for each cylinder of the engine individually in the complete characteristic diagram area and thus to suppress the differences in the fuel dosage of the individual injection units as a result of manufacturing variances.

Each injection unit is factory-marked with an IQA code -1-.

#### View from the top of the injection unit

- 1 - IQA code
- 2 - Data matrix IQA code
- 3 - Part number

The specifications provided in the figure are only one example.

After replacing the injection unit, the "IQA code" of the new injection unit must be written into the engine control unit.

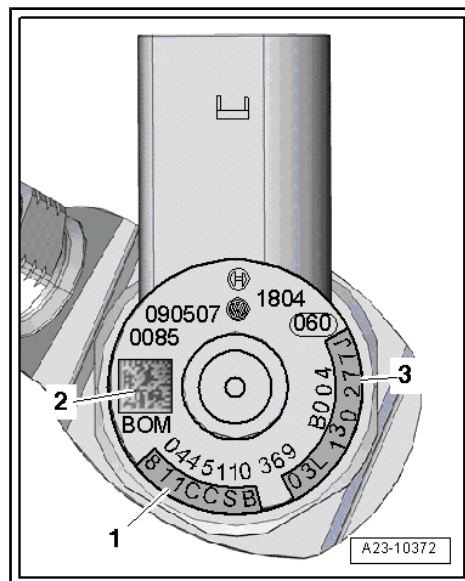
After replacing the engine control unit, the "IQA codes" for all the injection units must be written into the new engine control unit.

Adaptation process ⇒ Vehicle diagnostic tester.



#### Note

At the same time check if the "IQA codes" for all the other injection units are correctly written. If the correct "IQA codes" are stored in the engine control unit, these codes must never be entered again.



## 2.3 Removing and installing the injection units

⇒ "2.3.1 Removing", page 276

⇒ "2.3.2 Installing", page 279

#### Special tools and workshop equipment required

- ♦ Extractor - T10055-
- ♦ Assembly sleeve - T10377-
- ♦ Socket - T40055-

### 2.3.1 Removing



#### Note

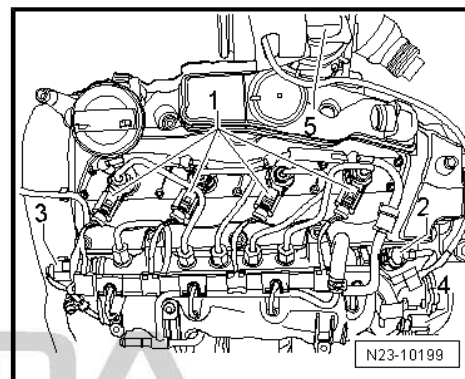
- ♦ *Safety precautions when working on the fuel supply system*  
⇒ "2.3 Safety precautions when working on fuel supply system", page 3 .
- ♦ *Observe rules for cleanliness*  
⇒ "2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4 .
- Remove engine cover  
⇒ "1.1 Removing and installing engine trim panel", page 7 .
- Take out the noise insulation at the injection units.



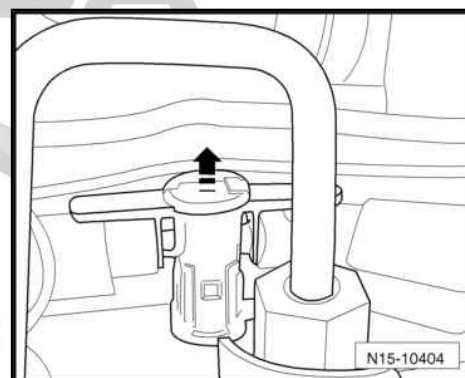
#### Caution

- ♦ *Mark the assignment of the injection units to the cylinders. They must only be re-used on the same cylinder.*
- ♦ *Immediately close the open connections with suitable caps.*

- Disconnect the plug -1- at the injection units to be removed.



- Hold the connection on the pegs, pull up the unlocking bolt in -direction of arrow- and detach the connection of the fuel return-flow line from the injection unit to be removed.



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### Note

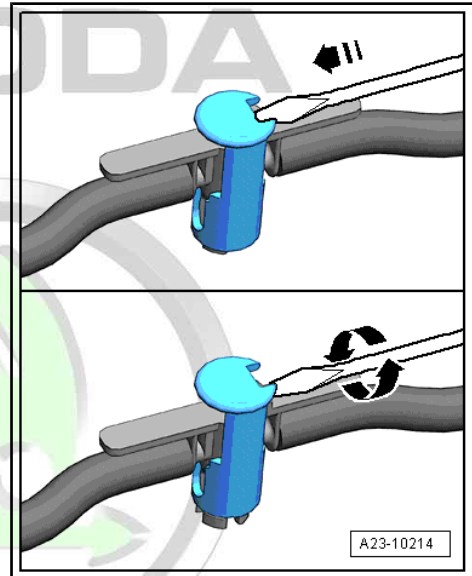
- ◆ If the unlocking bolt of the connection for the fuel return-flow line cannot be pulled up by hand, slacken the bolt by turning it with a narrow screwdriver -arrows-.
- ◆ Pay attention to cleanliness, no impurities must get into the open return lines and into the connections of the injection units.



### Caution

**When slackening the union nuts for the high pressure lines, counterhold the connection fitting with a lateral wrench. If the connection fitting loosens, this can cause leakage.**

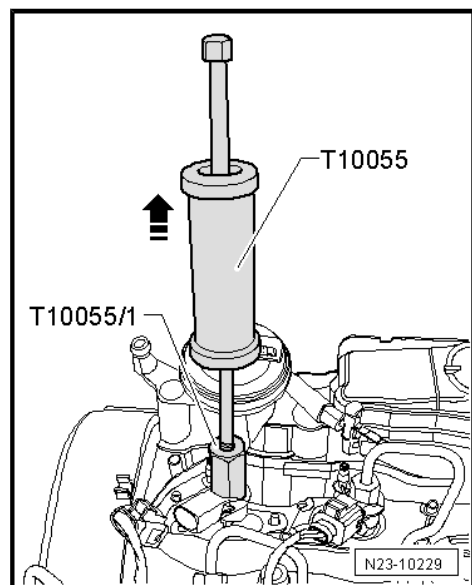
- Remove high pressure lines between high fuel pressure accumulator and the injection units to be removed.
- Unscrew the screws for the cover of the injection units to be removed.
- Slightly raise the covers and turn by 90° in order to unscrew the nuts for the clamping claws of the injection units to be removed.



### Caution

**When screwing the nuts for the clamping claws of the injection units, there is a risk that the nut falls into the cylinder head. Thus work very carefully in order to avoid unnecessary installation work or possible consequential damage.**

- Unscrew nuts for clamping claw of corresponding injection unit.
- Insert extractor - T10055- with adapter - T10055/1- , as shown in the illustration, and pull out the injection unit upwards by way of tapping.



## 2.3.2 Installing

### Important instructions for installing the injection units:

When reinstalling the injection unit, the following parts must be replaced:

- ◆ Copper seal
- ◆ O-ring for gasket of bore in cylinder head
- ◆ O-ring for fuel return-flow line
- ◆ Clamping claw

When installing the new injection unit, the following must also be replaced:

- ◆ High-pressure line between fuel high pressure reservoir and injection unit

### Instructions for reinstalling the injection units



#### Note

- ◆ *When reinstalling, the injection units and the high pressure lines must only be installed at the same point from which they were removed. Pay attention to the cylinder specific marking when re-using the high pressure lines.*
- ◆ *The reinstalled injection units or high pressure lines must not be damaged. The high pressure lines can be re-used after the following tests:*
- ◆ *Check the sealing cones and the union nuts for damage, deformations and tears.*
- ◆ *The inner line boring must not be deformed, constricted or damaged.*
- ◆ *The corroded injection lines must not be re-used.*
- ◆ *Check the injection units and the fitting positions for cleanliness before installing.*
- ◆ *All the O-rings must be coated with engine oil before installing.*

### If a used injection unit is reinstalled

- Spray the tip of the injection unit with a rust solvent spray. Remove the soot and grease particles with a cloth after approx. 5 minutes.
- Remove the old copper seal from the injection unit; to do so, carefully tighten the copper seal in a vice until the copper seal does no longer turn. Then pull the injection unit out of the copper seal with slight turning and pulling movements of the hand.

### Continued for all injection units

- Install the new copper gasket ring with the aid of a plastic bush.



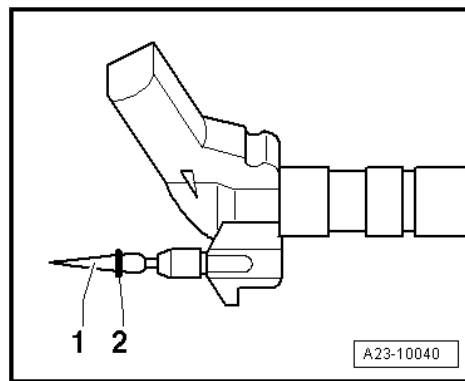


- Insert new O-ring -2- for fuel return-flow line via the drift pin -1- in order to not damage the O-ring.
- Clean the channel with a cloth soaked in engine oil or rust solvent in order to remove the soot particles on the contact surface of the injection unit in the cylinder head.



#### Caution

***Make sure the sealing surfaces are not damaged in the process.***



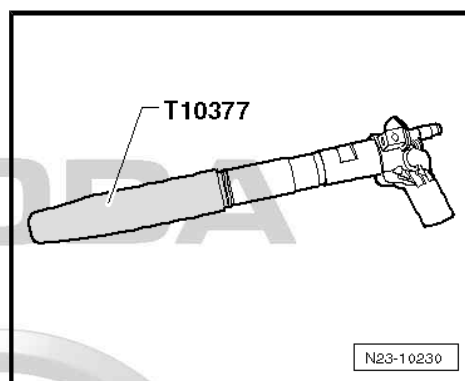
- Push the cover for the injection unit onto the injection unit.
- Replace O-ring for the cylinder head bore, to do so use assembly sleeve - T10377- .
- Push the clamping claw onto the injection unit, observe fitting position ➔ [page 275](#) .



#### Caution

***Pay particular attention in order to avoid unnecessary installation work or consequential damage.***

***Avoid damage and contact of the injection units with the cylinder head.***



- Carefully insert the injection unit into the bore in the cylinder head, pay attention to the fitting position.



#### Caution

***When screwing the nuts for the clamping claws of the injection units, there is a risk that the nut falls into the cylinder head. Thus work very carefully in order to avoid unnecessary installation work or possible consequential damage.***

- Carefully fit on the fixing nuts of the clamping claw by hand and tighten.
- Turn the cover of the injection units in the fitting position and screw it down.
- First tighten union nuts of the high pressure lines hand-tight.
- Install high pressure lines tension-free.

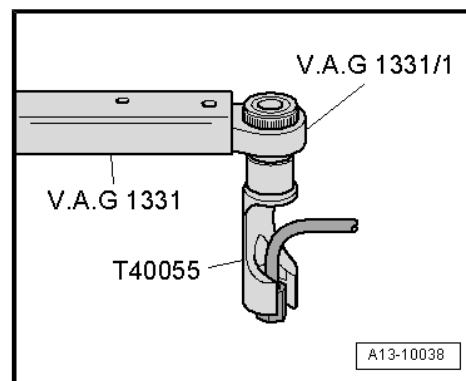
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- Use the socket wrench insert - T40055- for tightening the injection lines.
- Carefully push the connections of the fuel return line over the O-ring at the injection unit (check the O-ring for damage beforehand). The cap must click audibly into place, afterwards carefully press the unlocking bolt downwards.



#### Note

After replacing one or several injection units, carry out the adaptation according to their codes "injector quantity adjustment IQA" and "injector voltage adjustment IVA" ⇒ Vehicle diagnostic tester.



- Fill up the fuel system  
⇒ ["2.9 Fill the high pressure pump with fuel and discharge the fuel system", page 290](#) .

#### Tightening torques

- ◆ Injection unit  
⇒ ["2.1 Assembly overview - fuel system", page 271](#)
- ◆ High pressure lines  
⇒ ["2.1 Assembly overview - fuel system", page 271](#)

## 2.4 Removing and installing high fuel pressure accumulator

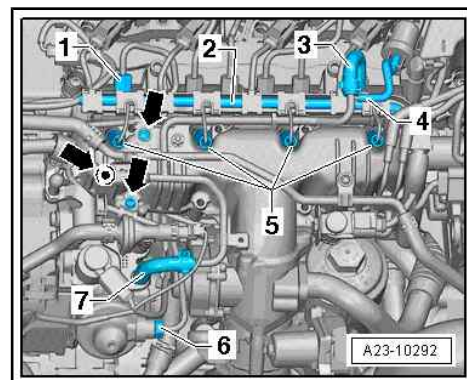
### Special tools and workshop equipment required

- ◆ **Socket wrench insert - T40055-** AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®



#### Note

- ◆ **Safety precautions when working on the fuel supply system**  
⇒ ["2.3 Safety precautions when working on fuel supply system", page 3](#) .
- ◆ **Observe rules for cleanliness**  
⇒ ["2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4](#) .
- Remove engine cover  
⇒ ["1.1 Removing and installing engine trim panel", page 7](#) .
- Remove fuel high pressure line, to do so slacken the union nut -6- at the high pressure pump and unscrew the union nut -1- at the high fuel pressure accumulator.
- Release the fixing screws -arrows- of the high fuel pressure line.
- Detach fuel return-flow line -3-.
- Collect the fuel which flows out with a cloth.



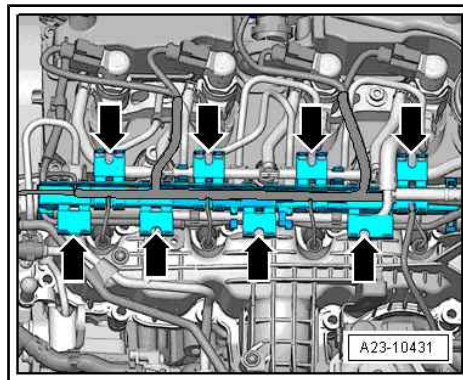


- Open the catches -arrows- of the cable guide and expose the wiring loom.
- Disconnect following plugs:
  - ◆ Fuel pressure sender - G247-
  - ◆ Fuel pressure regulating valve - N276-
  - ◆ for injection units
  - ◆ for glow plugs



### Caution

- ◆ **Mark the assignment of the high pressure lines to the cylinders, they must only be re-used on the same cylinder.**
- ◆ **Rules of cleanliness when working on the injection system.**
- ◆ **Immediately close the open connections with a suitable screw cap.**



- Remove high pressure lines between high fuel pressure accumulator and injection units. To do so, firstly remove the union nuts from the injection unit and then unscrew from the high fuel pressure accumulator.
- Place the removed high pressure lines on a clean cloth.
- Unscrew the two securing bolts and remove the fuel high pressure reservoir.

### Installing

Assembly is carried out in the reverse order. When installing, observe the following:



### Note

- ◆ *Pay attention to the cylinder specific marking when re-using the high pressure lines.*
- ◆ *The high pressure lines can be re-used after the following tests:*
  - ◆ *Check the sealing cones and the union nuts for damage, deformations and tears.*
  - ◆ *The inner line boring must not be deformed, constricted or damaged.*
  - ◆ *The corroded injection lines must not be re-used.*
- Install high pressure lines tension-free.

### Tightening torques

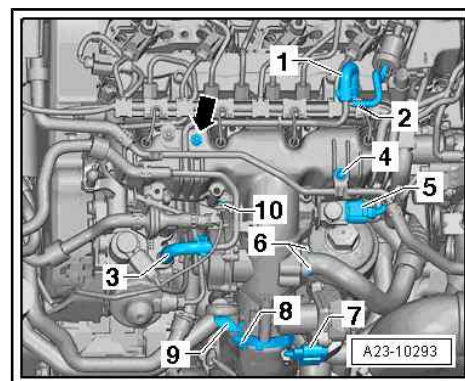
- ◆ **Summary of components Fuel system**  
⇒ **"2.1 Assembly overview - fuel system", page 271**

## 2.5 Check fuel pressure regulating valve - N276-

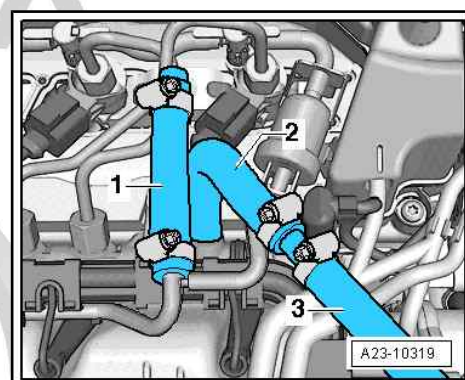


### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ *"2.3 Safety precautions when working on fuel supply system", page 3*.
- ◆ *Observe rules for cleanliness*  
⇒ *"2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4*.
- Remove engine cover  
⇒ *"1.1 Removing and installing engine trim panel", page 7*.
- Separate fuel return-flow hose -1- from fuel return-flow pipe.



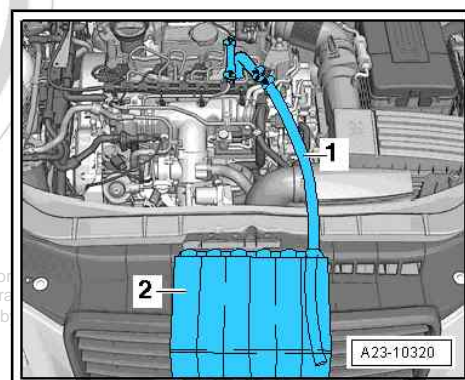
- Close the open connection at the pipe for the fuel return-flow line with a plug -1-.
- Connect the return-flow hose -2- from the fuel high pressure reservoir with the hose -3-.



- Hold this hose line -1- in a suitable vessel -2- in order to measure the fuel return-flow quantity.
- Start engine and run at idle speed.
- Set value: in 30 seconds 90-110 ml

If the specified value is not reached, the fuel pressure regulating valve - N276- is defective.

- Replace fuel pressure regulating valve - N276-  
⇒ *"2.6 Replace fuel pressure regulating valve N276", page 284*.





## 2.6 Replace fuel pressure regulating valve - N276-

The fuel pressure regulating valve - N276- is installed in the fuel high pressure reservoir and provides a constant pressure in the high-pressure fuel circuit.

If the pressure in the high-pressure fuel circuit is too high, the regulating valve opens and some of the fuel from the fuel high pressure reservoir flows back into the fuel tank via the fuel return-flow line.

The pressure control valve closes if there is too low a pressure in the high-pressure fuel circuit and thus seals the high-pressure side from the low-pressure side.



### Note

*The fuel pressure regulating valve - N276- is not reusable.*

### Special tools and workshop equipment required

- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves

### Removing



### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ *"2.3 Safety precautions when working on fuel supply system", page 3* .
- ◆ *Observe rules for cleanliness*  
⇒ *"2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4* .
- Remove engine cover  
⇒ *"1.1 Removing and installing engine trim panel", page 7* .



### WARNING

***Wear protective gloves and protective goggles when working with grease remover!***

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### Note

*No grease remover must get into the plug connection, carefully clean.*

- Also clean the thread area of the fuel pressure regulating valve - N276- with a grease remover - no dirt must get into the hole of the fuel high pressure reservoir.
- Dry fuel pressure regulating valve - N276- .
- Disconnect the plug at the fuel pressure regulating valve - N276- .
- Counterhold the fuel pressure regulating valve - N276- on the hexagon and slacken the screwed connection using a wrench.



- Unscrew the screwed connection by hand and remove the fuel pressure regulating valve - N276- from the fuel high pressure reservoir.
- Remove dirt from the thread, the sealing surface and the hole in the fuel high pressure reservoir. To do so do not use any mechanical tools.



**Note**

*Close the hole in the fuel high pressure reservoir immediately with a suitable screw plug in order to prevent dirt from penetrating.*

**Installing**



**Note**

- ◆ *The fuel pressure regulating valve - N276- does not have a gasket ring but a biting edge.*
- ◆ *The fuel pressure regulating valve - N276- is not reusable.*
- ◆ *The O-ring seals the high-pressure side from the low-pressure side and must be replaced.*
- ◆ *Before installing, moisten the O-ring and the hole in the fuel high pressure reservoir with diesel fuel.*
- ◆ *Pay attention to damage of the biting edge and the thread of the new fuel pressure regulating valve - N276-.*
- ◆ *Also check the sealing surface at the fuel high pressure reservoir.*
- Screw in the screwed connection and tighten by hand.
- Align the fuel pressure regulating valve - N276- in such a way that the connecting line is routed tension-free after fitting on the plug.
- Counterhold the fuel pressure regulating valve - N276- on the hexagon and tighten the screwed connection using a wrench.
- Check fuel system for tightness  
⇒ **“2.12 Check the fuel system for tightness”, page 295**

**Tightening torques**

- ◆ Fuel pressure regulating valve - N276-  
⇒ **“2.1 Assembly overview - fuel system”, page 271**

## **2.7 Removing and installing fuel pressure sender - G247-**

The fuel pressure sender - G247- is located in the fuel high pressure reservoir. It measures the current fuel pressure in the high pressure system and delivers a voltage signal to the engine control unit - J623-.

If the sender fails, the pressure regulation is controlled by the engine control unit via a characteristic diagram; in case of emergency, the maximum engine speed is limited to approx. 3000 rpm.

**Special tools and workshop equipment required**

- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves



## Removing



### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ *"2.3 Safety precautions when working on fuel supply system", page 3* .
- ◆ *Observe rules for cleanliness*  
⇒ *"2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4* .
- Remove engine cover  
⇒ *"1.1 Removing and installing engine trim panel", page 7* .



### WARNING

***Wear protective gloves and protective goggles when working with grease remover!***



### Note

- ◆ *No grease remover must get into the plug connection, carefully clean.*
- ◆ *No dirt must get into the hole of the fuel high pressure reservoir.*
- Before removing the fuel pressure sender - G247- , clean the thread area with a grease remover.
- Dry the fuel pressure sender - G247- .
- Disconnect plug at fuel pressure sender - G247- .



### Caution

***Do not slacken the fuel pressure sender using the open-end wrench or the open ring spanner - Risk of damage!***  
***Use lengthened socket insert.***

- Unscrew the fuel pressure sender - G247- .
- Remove dirt from thread hole and sealing surface on the fuel high pressure reservoir. To do so do not use any mechanical tools.

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### Note

***Close the hole in the fuel high pressure reservoir immediately with a suitable screw plug in order to prevent dirt from penetrating.***

## Installing



### Note

- ◆ *The fuel pressure sender - G247- has no gasket ring but a biting edge for sealing.*
- ◆ *Pay attention to damage of the sealing surface and thread of the fuel pressure sender - G247- . An undamaged fuel pressure sender - G247- can be installed repeatedly.*
- ◆ *Also check the sealing surface in the hole of the high fuel pressure accumulator.*



### Caution

***Do not tighten the fuel pressure sender using the open-end wrench or the open ring spanner - Risk of damage!***

***Use lengthened socket insert.***

- Screw in fuel pressure sender - G247- by hand.
- Tighten the fuel pressure sender - G247- .
- Check fuel system for tightness  
⇒ [“2.12 Check the fuel system for tightness”, page 295](#) .

### Tightening torques

- ◆ Fuel pressure sender - G247-  
⇒ [“2.1 Assembly overview - fuel system”, page 271](#)

## 2.8 Removing and installing the high pressure pump

### Special tools and workshop equipment required

- ◆ Counterholder - T10051-
- ◆ Extractor - T40064-
- ◆ Thrust piece - T40064/1-
- ◆ Cylinder head screws - T40064/2-

### Removing



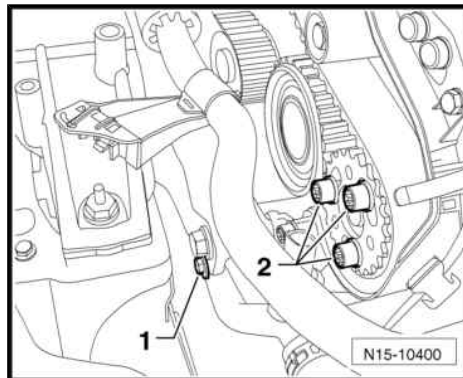
### Note

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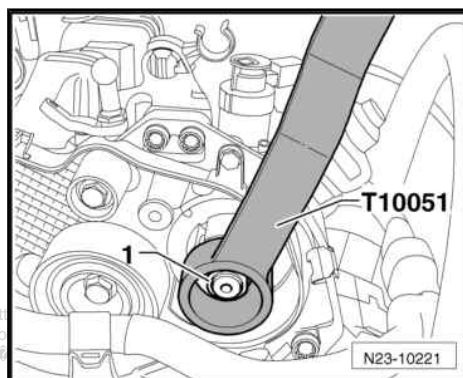
- ◆ *Safety precautions when working on the fuel supply system*  
⇒ [“2.3 Safety precautions when working on fuel supply system”, page 3](#) .
- ◆ *Observe rules for cleanliness*  
⇒ [“2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system”, page 4](#) .
- Pull toothed belt off camshaft sprocket and from toothed belt gear on the high pressure pump  
⇒ [“1.9 Removing and installing toothed belt”, page 55](#) .



- Release screws -2- and remove timing belt gear from the high pressure pump.



- Hold the hub of the high pressure pump with the counterholder - T10051- and unscrew the securing nut -1-.



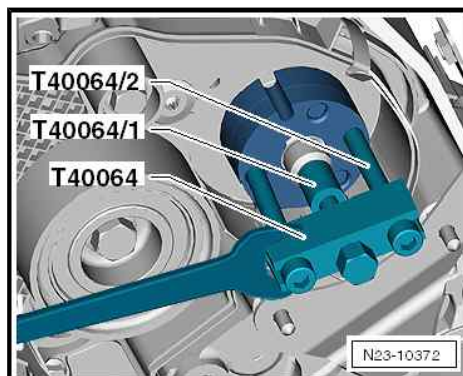
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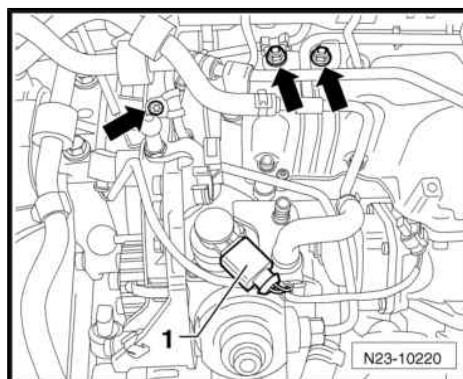
#### Note

*Replace the basic pressure plate with the pressure plate - T40064- on the extractor - T40064/1-.*

- Position extractor - T40064- with thrust piece - T40064/1- and cylinder screws (bolts) - T40064/2- as shown.
- Detach the hub from the high pressure pump, if necessary counterhold with a fixed spanner SW 24.



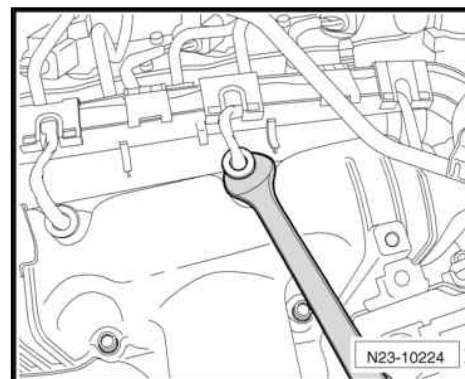
- Unscrew screws -arrows-.
- Lay the coolant line and the fuel return-flow line to the side.
- Slacken the wiring loom from the wiring guide of the glow plugs.



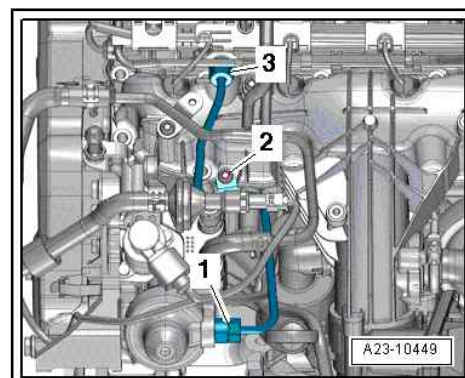
#### Caution

- ♦ *Carefully remove the glow plug connectors from the glow plugs.*
- ♦ *If the plug is damaged when disconnecting it, the complete wiring loom including the plugs must be replaced (plugs cannot be replaced separately).*

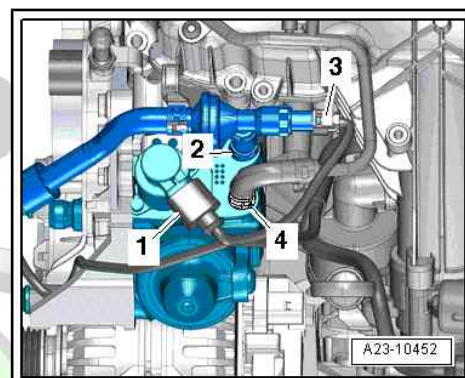
- Carefully disconnect the plug from the glow plugs. Use the assembly spanner SW 11 for help.



- Unscrew union nuts -1- and -3-.
- Unscrew fixing screw -2- and remove the high pressure line.



- Disconnect plugs -1- and -3-.
- Remove fuel intake hose -2- and fuel return-flow hose -4-.



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- Release the fixing screws -arrows- of the high pressure pump.
- Carefully remove the high pressure pump.

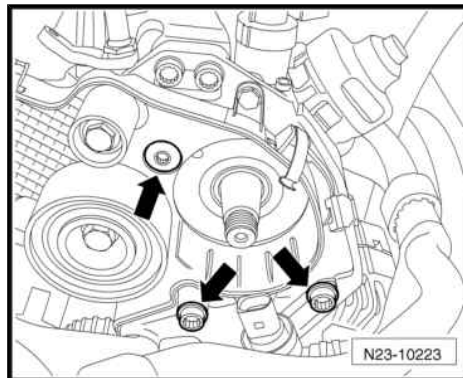
#### Installing



#### Caution

**Risk of damage to the high pressure pump through running dry.**

- ◆ After reinstalling the high pressure pump: carry out the basic setting "check fuel pump" »3 times« before the first engine start → Vehicle diagnostic tester.
- ◆ After installing a new high pressure pump: fill up the high pressure pump with fuel before the first engine start  
⇒ **"2.9 Fill the high pressure pump with fuel and discharge the fuel system", page 290**.



Assembly is carried out in the reverse order. When installing, observe the following:



#### Note

- ◆ When installing the high pressure pump, ensure that no dirt penetrates the fuel system.
- ◆ Only remove the screw plug immediately before installing the fuel lines.
- ◆ The fixing screws for the high pressure pump must be replaced.

#### Tightening torques

- ◆ Summary of components - Fuel system  
⇒ **"2.1 Assembly overview - fuel system", page 271**

## 2.9 Fill the high pressure pump with fuel and discharge the fuel system

#### Special tools and workshop equipment required

- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves



#### Caution

**Risk of damage to the high pressure pump from running dry.**

- ◆ After installing a new high pressure pump, the high pressure pump must be filled up with fuel before the first engine start. Avoid the high pressure pump to run dry.



#### Note

- ◆ When installing the high pressure pump, ensure that no dirt penetrates the fuel system.
- ◆ Only remove the screw plug immediately before installing the fuel lines.

### Conditions

- On vehicles with automatic gearbox the selector lever must be in position "P".
- Vehicle must be refuelled.
- Temperature of the fuel system is  $\geq 15\text{ }^{\circ}\text{C}$ .

**In order to fill up the high pressure pump with fuel, proceed as follows:**

- Connect  $\Rightarrow$  Vehicle diagnostic tester and switch on ignition.

### Select operating mode

- Press the button **vehicle self-diagnosis** on the screen.

### Select vehicle system

- Press the button **01 - Engine Electronics** on the screen.

The control unit identification and the coding of the engine control unit are indicated on the display.

### Select diagnosis function

- Press the button **006 - Basic setting** on the screen.
- Enter the display group "35" via the numerical key pad and confirm with **Q**.
- Afterwards press the **Activate** button.
- ◆ The fuel pumps start running for approx. 60 seconds.
- Repeat this work procedure 3x.

This ensures that the high pressure pump is adequately filled up with fuel.



### WARNING

***Wear protective gloves and protective goggles when working with grease remover!***



- Degrease the union nuts -1- and -3- of the high pressure line and their surrounding area at the high pressure pump and at the fuel high pressure reservoir.
- Start the engine and let it run at an average speed for a few minutes.
- Switch off engine and carry out a visual inspection of the fuel system for leaks.

If there is leakage despite the correct tightening torque:

- Replace the affected component part and repeat the filling/bleeding procedure ⇒ [page 291](#) .

If no leaks are found:

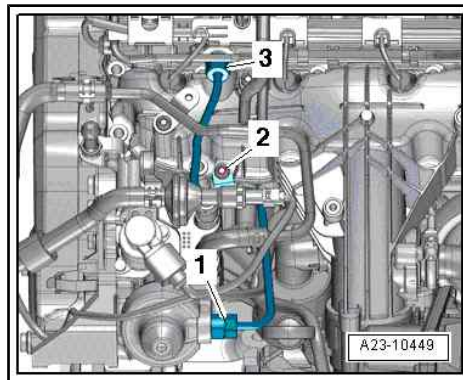
- Carry out a test drive with minimum one full load acceleration up to max. speed.
- Once again carry out a visual inspection of the fuel system for leaks.

If there is leakage despite the correct tightening torque:

- Replace the affected component part and repeat the filling/bleeding procedure ⇒ [page 291](#) .

If no leaks are found:

- Query and if necessary erase event memory of engine control unit ⇒ Vehicle diagnostic tester.
- Check readiness code, if necessary re-generate ⇒ Vehicle diagnostic tester.



## 2.10 Check the low pressure fuel system

### Special tools and workshop equipment required

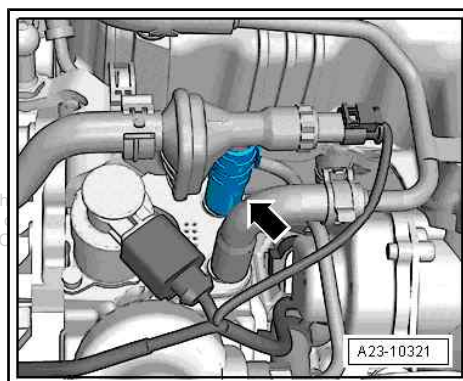
- ◆ Pressure gauge - V.A.G 1318-

### Conditions

- Battery voltage at least 12.5 volts
- Fuel filter OK.
- Fuel tank at least  $\frac{1}{2}$  full.
- Ignition off.

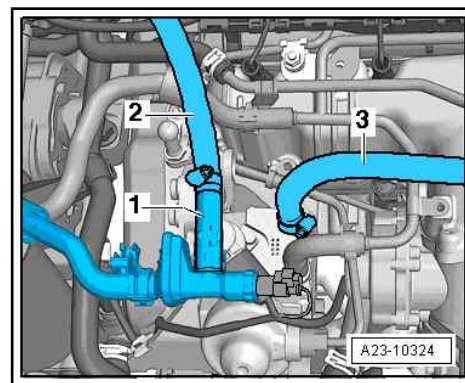
### Pressure test

- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .
- Detach the fuel feed line -arrow- from the high pressure pump.



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- Connect the pressure gauge - V.A.G 1318- with suitable adapter -2- to the fuel feed line -1- and, using another adapter -3-, connect it to the open connection on the high pressure pump.



- Measure the fuel pressure with the pressure gauge - V.A.G 1318- connected to the feed line:
- Connect ⇒ Vehicle diagnostic tester and switch on ignition.
- Switch on ignition.

#### Select operating mode

- Press the button **vehicle self-diagnosis** on the screen.

#### Select vehicle system

- Press the button **01 - Engine Electronics** on the screen.

The control unit identification and the coding of the engine control unit are indicated on the display.

#### Select diagnosis function

- Press the button **Basic setting** on the screen.
- Enter the display group “35” via the numerical key pad and confirm with **Q**.
- Afterwards press the **Activate** button.

The fuel pumps activate.

- Continue running the fuel pumps until the fuel pressure stops rising.

Specified value: min. 0.35 MPa (3.5 bar)

If the specified value for the minimum fuel pressure is still not reached:

- Inspection:
  - ◆ Leak-tightness of the pressure gauge - V.A.G 1318- and connected adapter.
  - ◆ Condition and leak-tightness of the fuel lines and connections in the low-pressure area.
  - ◆ Condition and passage of the fuel filter.

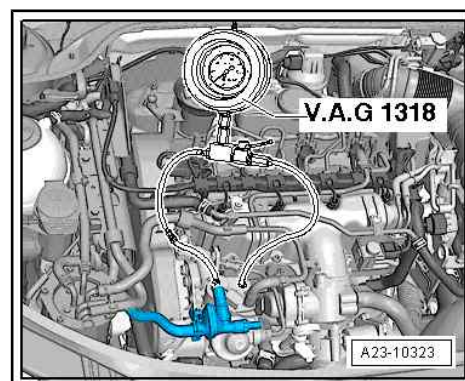
If no leaks are found or a blockage is discovered:

- Check the fuel flow rate of the fuel pump  
⇒ **“2.11 Check the fuel flow rate of the fuel pump”, page 293**.

## 2.11 Check the fuel flow rate of the fuel pump

### Special tools and workshop equipment required

- ◆ Measuring glass with a volume of 1 litre





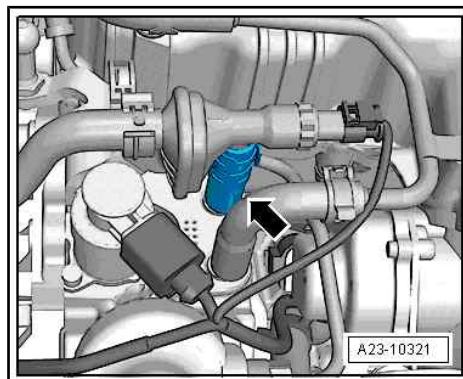


## Conditions

- Battery voltage at least 12.5 volts
- Fuel filter OK.
- Fuel tank at least  $\frac{1}{2}$  full.
- Ignition off.

## Check fuel flow rate

- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .
- Detach the fuel feed line -arrow- from the high pressure pump.



- Inspect the fuel feed line -1- in the measuring glass -2-.
- Connect ⇒ Vehicle diagnostic tester.
- Switch on ignition.

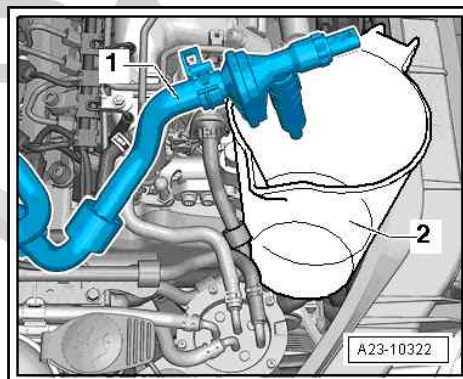
## Select operating mode

- Press the button `vehicle self-diagnosis` on the screen.

## Select vehicle system

- Press the button `01 - Engine Electronics` on the screen.

The control unit identification and the coding of the engine control unit are indicated on the display.



## Select diagnosis function

- Press the button `Basic setting` on the screen.
- Enter the display group “35” via the numerical key pad and confirm with `Q`.
- Afterwards press the `Activate` button.

The fuel pumps activate.

- Allow the fuel pumps to run for 15 seconds and then end activation.

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Set value: in 15 seconds min. 500 ml

If the desired minimum delivery volume is not reached, it can be caused by the following faults:

- ◆ The pumps did not run the entire 15 seconds.
- ◆ Fuel filter is clogged.
- ◆ Fuel lines are squashed.
- ◆ The fuel pumps are faulty.



## 2.12 Check the fuel system for tightness

### Special tools and workshop equipment required

- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves

### Work procedure



#### WARNING

*Wear protective gloves and protective goggles when working with grease remover!*

- Degrease all fuel connections.
- Let the engine run at idling speed for a few minutes.
- Carry out a visual inspection of the complete fuel system for leaks after switching off the engine.

If there is leakage despite the correct tightening torque:

- Replace the related component part and repeat the leak check.

If no leaks are found:

- Carry out a test drive with minimum one full load acceleration up to max. speed.
- Then once again carry out a visual inspection of the complete fuel system for leaks.

If there is leakage despite the correct tightening torque:

- Replace the related component part and once again repeat the leak check.

If no leaks are found:

- Query and if necessary erase event memory of engine control unit ⇒ Vehicle diagnostic tester.
- After deleting the event memory of the engine control unit the readiness code must be checked and if necessary re-generated ⇒ Vehicle diagnostic tester.

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## 2.13 Check the pressure holding valve in the fuel return-flow line

The pressure holding valve in the fuel return-flow line has the function to always hold a remaining pressure of approx. 1 MPa (10 bar).

The injection units need this pressure to perform correctly.

### Special tools and workshop equipment required

- ◆ Pressure gauge , e.g. -VAS 6330-
- ◆ Adapter , e.g. -V.A.G 1318/17A-
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves



## Test sequence



### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ *"2.3 Safety precautions when working on fuel supply system", page 3*.
- ◆ *Observe rules for cleanliness*  
⇒ *"2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4*.
- Remove engine cover  
⇒ *"1.1 Removing and installing engine trim panel", page 7*.



### WARNING

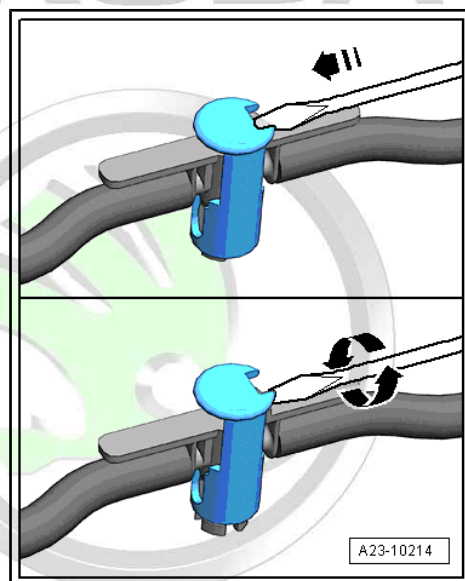
***Wear protective gloves and protective goggles when working with grease remover!***

- Before removing, clean the return line connection at the injection unit of cylinder 1 with a grease remover.
- Dry the return line connection of cylinder 1.
- Cover the return line connection of cylinder 1 with a cloth.
- Disconnect connection of the fuel return line at cylinder 1; to do so, pull the unlocking bolts upwards.



### Note

- ◆ *If the unlocking bolt of the connection for the fuel return-flow line cannot be pulled up by hand, slacken the bolt by turning it with a narrow screwdriver -arrows-*.
- ◆ *Pay attention to cleanliness, no impurities must get into the open return lines and into the connections of the injection units.*

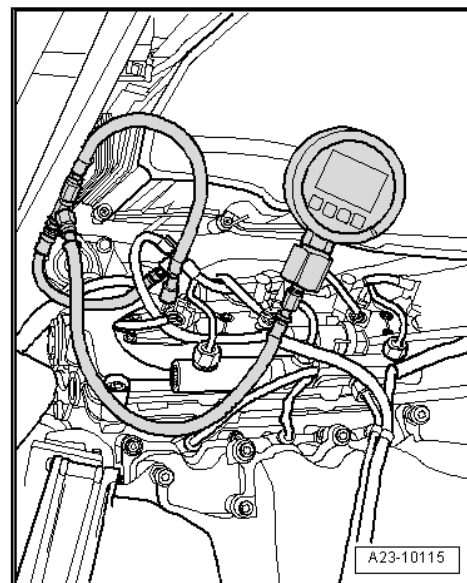


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- Connect the pressure gauge e. g. -VAS 6330- between the return line connection on the injection unit and the return-flow line.
- Open shut-off cock of the pressure gauge.
- Start engine and run in idle.
- Read the pressure on the pressure gauge - VAS 6330- .
  - Set value: 0.8-1.4 MPa (8-14 bar)

If the specified value is not reached, the pressure holding valve is defective.

- Completely replace the fuel return-flow line of the injection units.



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## 2.14 Check the fuel return-flow line on the injection units

⇒ [“2.14.1 Check while engine is running”, page 297](#)

⇒ [“2.14.2 When the engine spins freely, check with starter”, page 299](#)

### 2.14.1 Check while engine is running

Special tools and workshop equipment required

- ◆ Measuring vessel



#### Note

- ◆ *Safety precautions when working on the fuel supply system*  
⇒ [“2.3 Safety precautions when working on fuel supply system”, page 3](#) .

- ◆ *Observe rules for cleanliness*  
⇒ [“2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system”, page 4](#) .

- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .



- Disconnect hose connection of fuel return flow lines after the pressure holding valve -2-.
- Close the return-flow line connection with a blind plug -1-.
- Hold the open hose line -3- (where necessary, extended using a suitable adapter) in the measuring vessel.
- Start engine and run in idle for 2 minutes.
- Set value in 2 minutes: 0 ml to 50 ml

If the fuel return-flow volume is less than the specified value:

- Increase the engine speed to 2000 to 2500 rpm and measure the fuel return-flow volume again.
- Set value in 2 minutes: less than 250 ml

If the fuel return-flow volume is larger than the specified value, this means that one or more injection units are probably defect. In this case, the faulty injection valves are identified by means of a return flow check on each injection unit ⇒ [page 298](#).

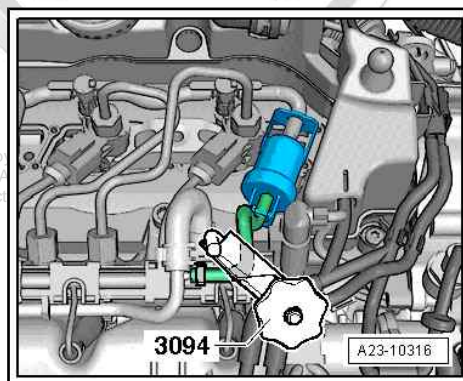
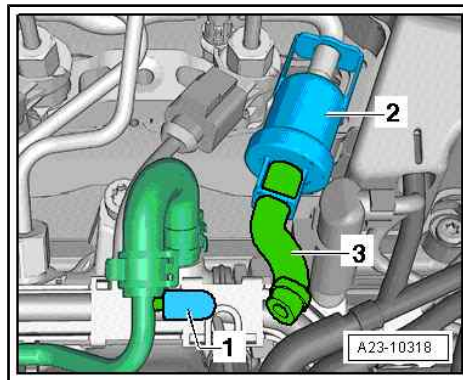
### Check the return line of each individual injection unit

#### Special tools and workshop equipment required

- ◆ Measuring device - V.A.G 1348/2B-
- ◆ "Hose connection" for connecting to the connection of the return line on the injection unit (self setup required) 4 pieces
- ◆ Hose clamp - MP7-602 (3094)-
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves

#### Work procedure

- Clean all of the return line connections to the injection units with cleaning and degreasing agents.
- Before removal, dry all of the cleaned parts.
- Unclamp the fuel return line after the pressure holding valve with hose clamp - MP7-602 (3094)- .
- Remove all connections from the fuel return line at all four injection units. To do so, pull the unlocking bolts upwards.



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**i Note**

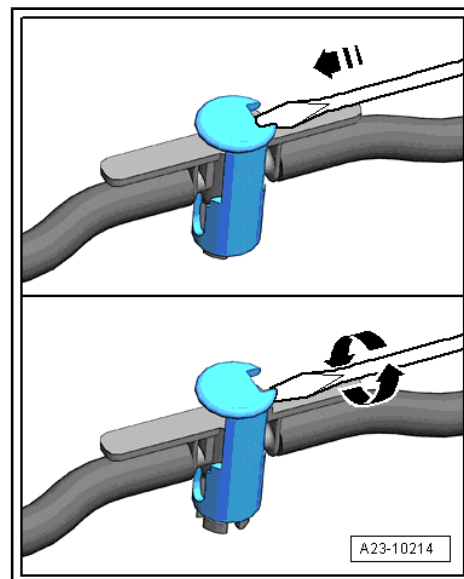
- ◆ If the unlocking bolt of the connection for the fuel return-flow line cannot be pulled up by hand, slacken the bolt by turning it with a narrow screwdriver -arrows-.
- ◆ Pay attention to cleanliness, no impurities must get into the open return lines and into the connections of the injection units.
- Plug the "hose lines" onto the open return line connections on all four injection units.
- Insert the free ends of the "hose lines" into the measuring glasses of the measuring device - V.A.G 1348/2B- .
- Start engine and run in idle for 2 minutes.



**WARNING**

**No acceleration must occur during testing - the engine must only run in idle.**

**When the return flow line is removed, the increased engine speed causes damage to the injection valves.**



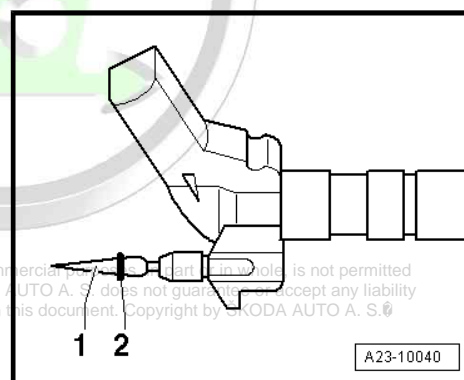
The return flow quantities in the individual injection units are only allowed to marginally differ when the engine is at its operating temperature. If one injection unit has a significantly higher return flow quantity, this is probably faulty:

- Replace injection unit  
⇒ ["2.3 Removing and installing the injection units", page 276](#) .

**Install fuel return-flow line**

**i Note**

- ◆ Wet the O-rings with engine oil before assembly.
- ◆ Insert new O-ring -2- for fuel return-flow line via the drift pin -1- in order to not damage the O-ring.
- Replace O-rings at all injection valves.
- Carefully push the connections of the fuel return line over the O-ring at the injection unit (check the O-ring for damage beforehand). The cap must click audibly into place, afterwards carefully press the unlocking bolt downwards.
- Check fuel system for tightness  
⇒ ["2.12 Check the fuel system for tightness", page 295](#) .



## 2.14.2 When the engine spins freely, check with starter

If the engine will not start, the fuel return-flow quantity is checked with the starter by the injection units when the engine spins freely.

**Special tools and workshop equipment required**

- ◆ Measuring device - V.A.G 1348/2B-





- ◆ "Hose connection" for connecting to the connection of the return line on the injection unit (self setup required) 4 pieces
- ◆ Hose clamp - MP7-602 (3094)-
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves



#### Note

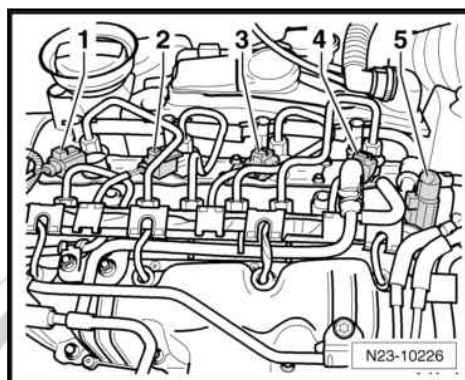
- ◆ *Safety precautions when working on the fuel supply system*  
⇒ *"2.3 Safety precautions when working on fuel supply system", page 3 .*
- ◆ *Observe rules for cleanliness*  
⇒ *"2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4 .*
- Remove engine cover  
⇒ *"1.1 Removing and installing engine trim panel", page 7 .*
- Disconnect connector -5- from the fuel pressure regulating valve - N276- .



#### Note

*Pulling off the fuel pressure regulating valve - N276- prevents fuel injection when the engine spins with starter.*

- Clean all of the return line connections to the injection units with cleaning and degreasing agents.
- Before removal, dry all of the cleaned parts.
- Remove all connections from the fuel return line at all four injection units. To do so, pull the unlocking bolts upwards.



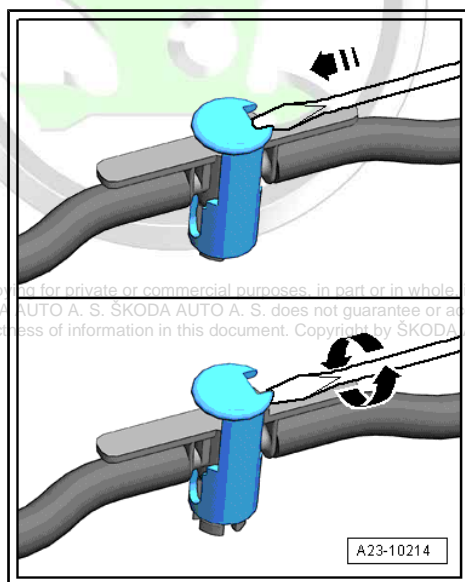
#### Note

- ◆ *If the unlocking bolt of the connection for the fuel return-flow line cannot be pulled up by hand, slacken the bolt by turning it with a narrow screwdriver -arrows-.*
- ◆ *Pay attention to cleanliness, no impurities must get into the open return lines and into the connections of the injection units.*

- Plug the "hose lines" onto the open return line connections on all four injection units.
- Insert the free ends of the "hose lines" into the measuring glasses of the measuring device - V.A.G 1348/2B- .
- Actuate the starter 3 x briefly for around 20 seconds delay between when the starter cools down and the separate start attempts.
- Set value for fuel return-flow volume: 0 ml

If fuel is leaking from one fuel injection unit, that injection unit is probably faulty.

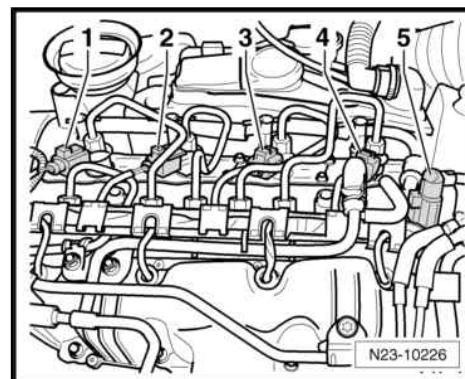
- Replace injection unit  
⇒ *"2.3 Removing and installing the injection units", page 276 .*



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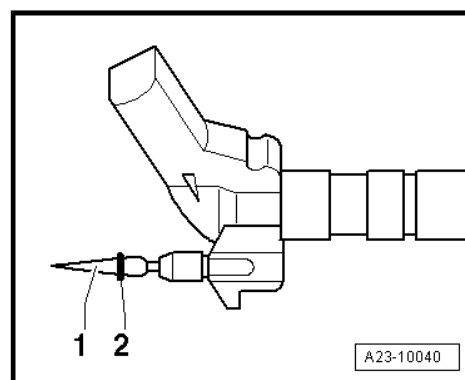
- Insert connector -5- from the fuel pressure regulating valve - N276- .
- Connect the ⇒ Vehicle diagnostic tester and erase the event memory.

#### Install fuel return-flow line



#### Note

- ◆ *Wet the O-rings with engine oil before assembly.*
- ◆ *Insert new O-ring -2- for fuel return-flow line via the drift pin -1- in order to not damage the O-ring.*
- Replace O-rings at all injection valves.
- Carefully push the connections of the fuel return line over the O-ring at the injection unit (check the O-ring for damage beforehand). The cap must click audibly into place, afterwards carefully press the unlocking bolt downwards.
- Check fuel system for tightness  
⇒ **"2.12 Check the fuel system for tightness", page 295** .



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### 3 Intake manifold, air filter

⇒ "3.1 Summary of components - intake manifold", page 302

⇒ "3.2 Removing and installing the throttle valve control unit J338", page 303

⇒ "3.3 Removing and installing intake manifold", page 304

⇒ "3.4 Summary of components - air filter", page 305

⇒ "3.5 Removing and installing air filter housing", page 307

#### 3.1 Summary of components - intake manifold

##### 1 - Intake manifold

- ☐ with intake manifold flap motor - V157-
- ☐ with intake air-intrinsic optimisation
- ☐ must not be disassembled
- ☐ Removing and installing ⇒ "3.3 Removing and installing intake manifold", page 304

##### 2 - Screw

- ☐ 8 Nm

##### 3 - Seal

- ☐ Replace after removal

##### 4 - Sealing ring

- ☐ Replace after removal

##### 5 - Connecting pipe

- ☐ to radiator for exhaust gas recirculation



##### Caution

*Pay attention that the bellows of the connection pipe is not bent or overstretched. There is a risk of crack formation.*

##### 6 - Screw

- ☐ to release and tighten use socket insert - T10385-
- ☐ 20 Nm

##### 7 - Seal

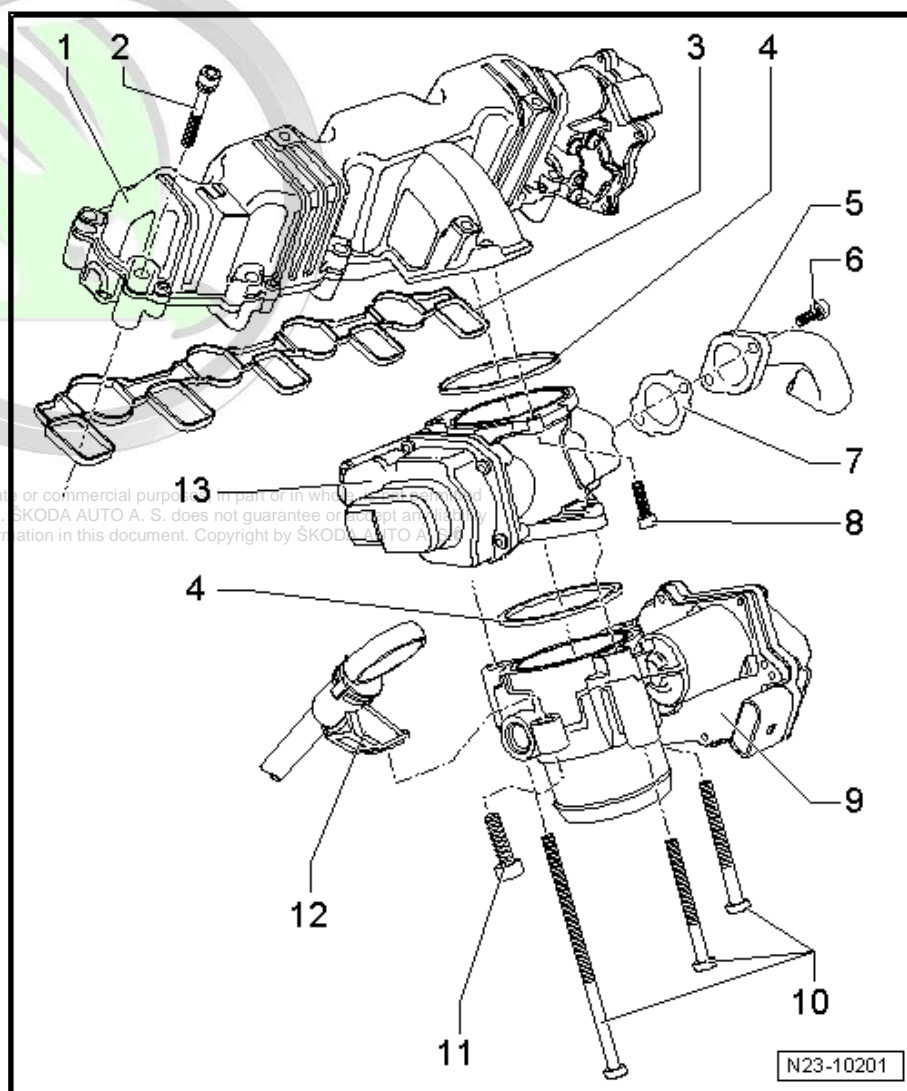
- ☐ Replace after removal

##### 8 - Screw

- ☐ 8 Nm

##### 9 - Throttle valve control unit - J338-

- ☐ Removing and installing ⇒ "3.2 Removing and installing the throttle valve control unit J338", page 303



**10 - Screw**

- 10 Nm

**11 - Screw**

- 10 Nm

**12 - Dipstick**

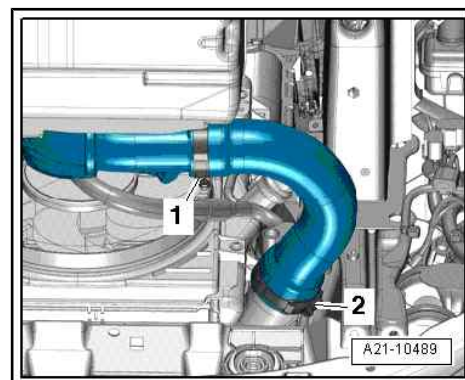
**13 - Exhaust gas return valve - N18-**

- with EGR potentiometer - G212-

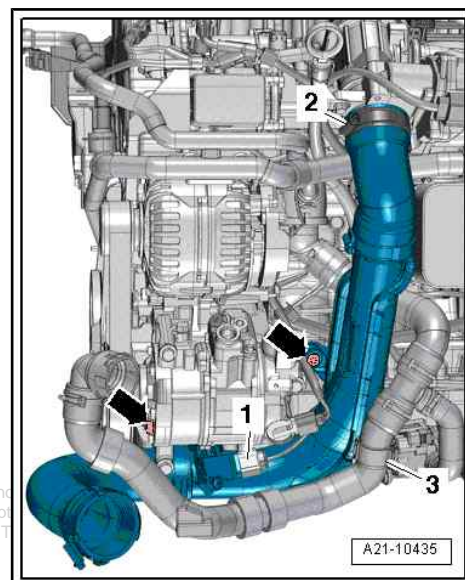
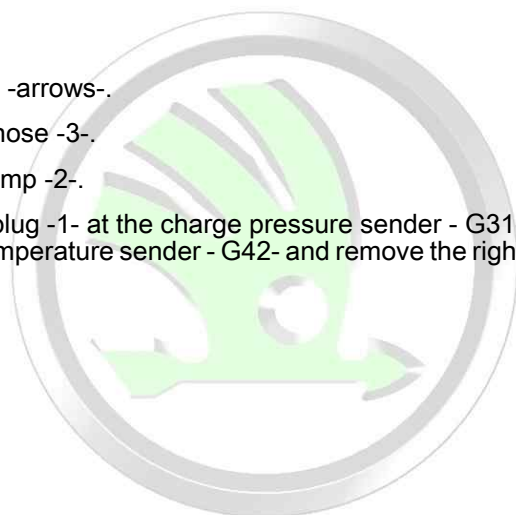
## 3.2 Removing and installing the throttle valve control unit - J338-

### Removing

- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .
- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .
- Remove the charge air hose, to do so slacken the screw clamps -1- and -2-.



- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Loosen hose clamp -2-.
- Disconnect the plug -1- at the charge pressure sender - G31- with intake air temperature sender - G42- and remove the right charge air pipe.



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- Disconnect the plug -2- from the throttle valve control unit - J338- .
- Release screw -1- of guide pipe for oil dipstick.
- Remove screws -arrows- and remove the throttle flap control unit - J338- .

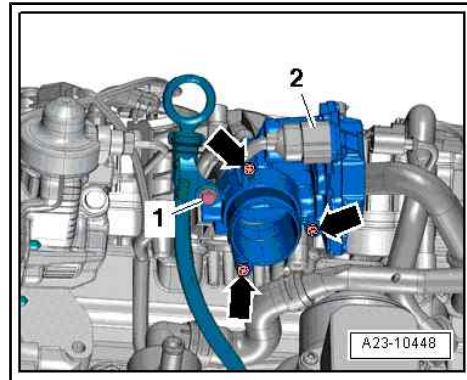
### Installing

Assembly is carried out in the reverse order. When installing, observe the following:



#### Note

Renew O-ring.



### Tightening torques

- ♦ Screws of the throttle valve control unit - J338-  
⇒ ["3.1 Summary of components - intake manifold", page 302](#) .
- ♦ Charge air pipe Octavia II  
⇒ ["2.1 Summary of components - Charge air cooler Octavia II", page 255](#) .
- ♦ Charge air pipe Superb II  
⇒ ["2.2 Summary of components - Charge air cooler Superb II", page 256](#) .
- ♦ Charge air pipe Yeti  
⇒ ["2.3 Summary of components - Charge air cooler Yeti", page 257](#) .

## 3.3 Removing and installing intake manifold

### Special tools and workshop equipment required

- ♦ Socket insert T30 - T10405-

### Removing



#### Note

- ♦ *Safety precautions when working on the fuel supply system*  
⇒ ["2.3 Safety precautions when working on fuel supply system", page 3](#) .
- ♦ *Observe rules for cleanliness*  
⇒ ["2.4 Regulations concerning cleanliness when working on the fuel supply/fuel injection system", page 4](#) .

- Remove engine cover  
⇒ ["1.1 Removing and installing engine trim panel", page 7](#) .
- Slacken the wiring loom from the wiring guide of the glow plugs.

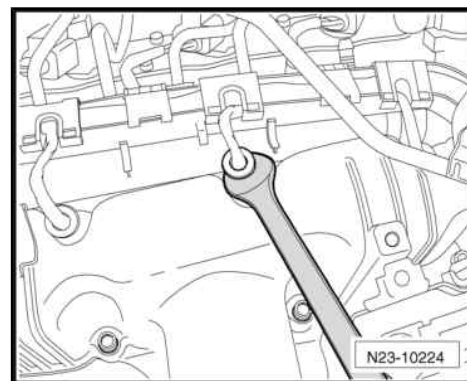


#### Caution

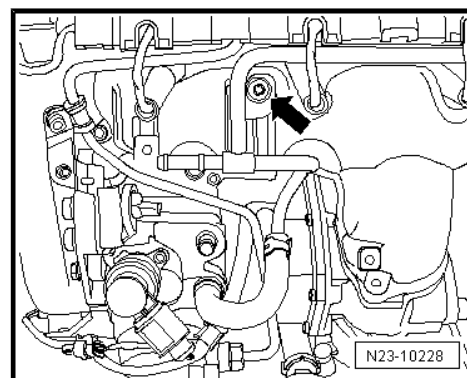
- ♦ *Carefully remove the glow plug connectors from the glow plugs.*
- ♦ *If the plug is damaged when disconnecting it, the complete wiring loom including the plugs must be replaced (plugs cannot be replaced separately).*



- Carefully disconnect the plug from the glow plugs. Use the assembly spanner SW 11 for help.



- Separate the fuel return-flow lines from the high pressure reservoir, from the injection units and the high pressure pump.
- Unscrew fixing screw -arrow- and remove fuel return-flow line.
- Remove the high pressure line between the high pressure pump and the high fuel pressure accumulator  
⇒ [“2.4 Removing and installing high fuel pressure accumulator”, page 281](#).

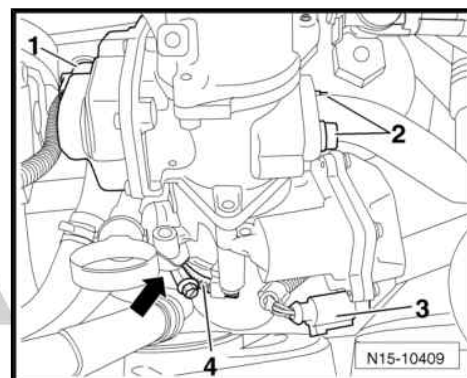


#### Vehicles with plastic intake manifold

- Remove fuel high pressure reservoir  
⇒ [“2.4 Removing and installing high fuel pressure accumulator”, page 281](#).

#### Continued for all vehicles

- Remove connector -1- from the exhaust gas recirculation system - N18- and connector -3- from the throttle flap control unit - J338-.
- Open clamp -4- and remove connecting hose.
- Unscrew the screws from the connection of the oil dipstick -arrow- and from the connection pipe for exhaust gas recirculation -2-.
- Release fixing screws for intake manifold crosswise from the outside to the inside using the socket insert T30 - T10405-.
- Remove intake manifold.



#### Installing

Assembly is carried out in the reverse order. When installing, observe the following:

- Replace gasket.
- Tighten the fixing screws of the intake manifold crosswise from inside to outside.

#### Tightening torques

- ◆ Screws for the intake manifold  
⇒ [“3.1 Summary of components - intake manifold”, page 302](#)

### 3.4 Summary of components - air filter



**1 - intake hose**

- ☐ to exhaust gas turbo-charger

**2 - Vent pipe connection piece**

- ☐ With heating
- ☐ Only vehicles for cold climates

**3 - Connecting pipe**

- ☐ for crankcase ventila-tion
- ☐ to remove, press re-lease buttons

**4 - Screw**

- ☐ 2 Nm

**5 - Air mass meter - G70-**

**6 - O-ring**

- ☐ Replace if damaged.

**7 - Screw**

- ☐ Fixing screws for air fil-ter top part
- ☐ 2 Nm

**8 - Screw**

- ☐ Fixing screw for air filter housing (air filter lower part)
- ☐ 8 Nm

**9 - Bushing**

**10 - Washer**

**11 - Air filter top part**

- ☐ Removing and installing air filter housing ⇒ ["3.5 Removing and installing air filter housing", page 307](#)

**12 - Air filter element**

- ☐ Pay attention to change intervals:

◆ ⇒ Maintenance ; Booklet Octavia II

◆ ⇒ Maintenance ; Booklet Superb II

◆ ⇒ Maintenance ; Booklet Yeti

**13 - Air filter bottom part**

- ☐ Removing and installing air filter housing ⇒ ["3.5 Removing and installing air filter housing", page 307](#)

**14 - Connection piece**

- ☐ for water drain hose

**15 - Overrun valve**

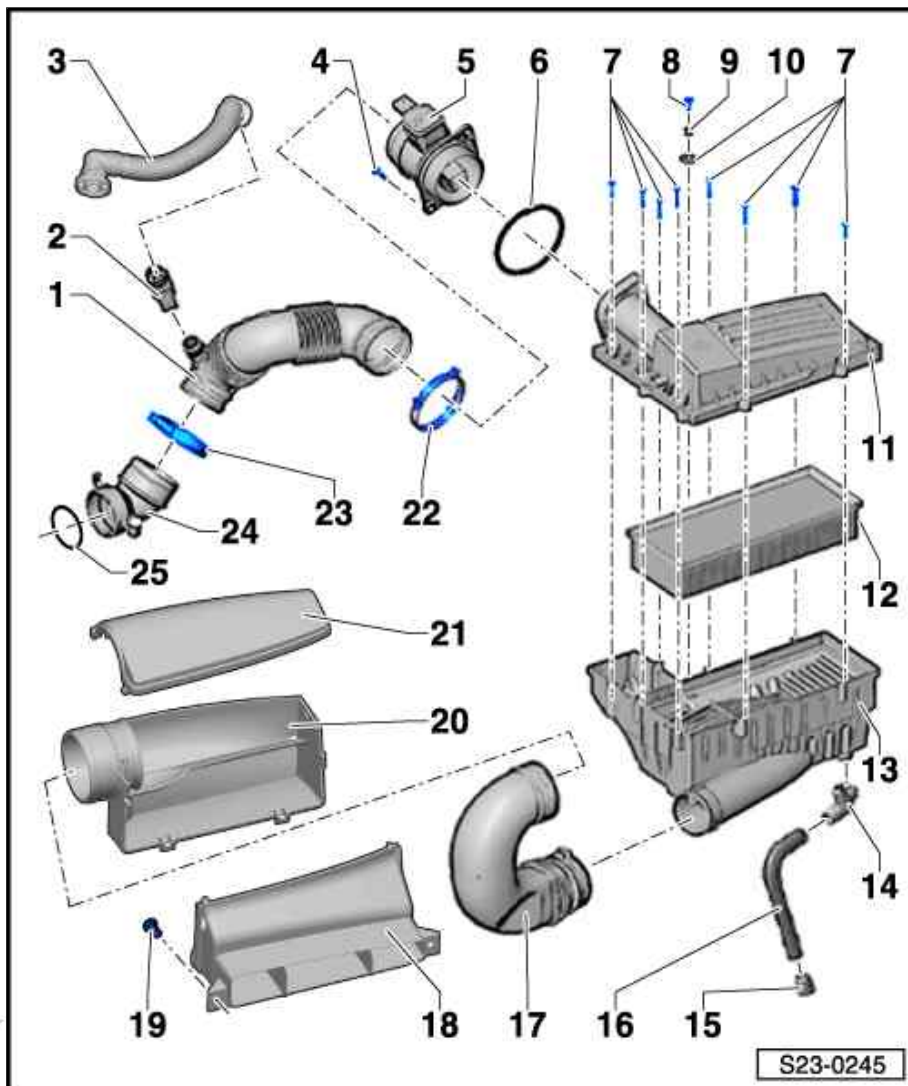
**16 - Hose**

- ☐ For water drainage

**17 - Connecting hose**

**18 - Inlet connection**

- ☐ screwed onto lock carrier



#### 19 - Screw

- ☐ 2 Nm

#### 20 - Intake air duct

#### 21 - Screw cap

- ☐ For intake air duct

#### 22 - Spring strap clamp

#### 23 - Spring strap clamp

#### 24 - Inlet connection

- ☐ with fixing screw
- ☐ Observe fitting position to exhaust gas turbocharger ➔ [page 308](#)
- ☐ 9 Nm

#### 25 - O-ring

- ☐ Replace after removal

### 3.5 Removing and installing air filter housing

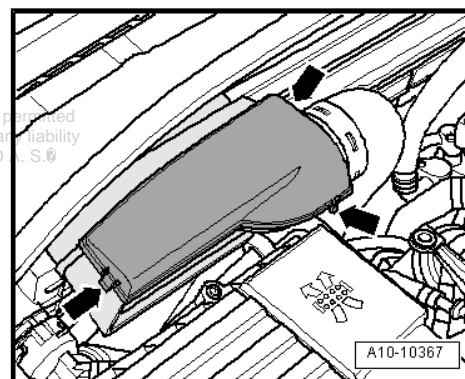
#### Special tools and workshop equipment required

- ◆ Pliers for spring-type clips

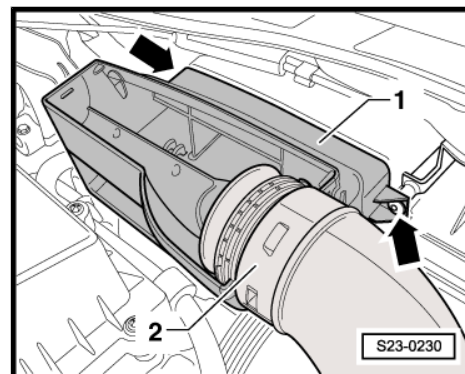
#### Removing

- Remove engine cover  
➔ ["1.1 Removing and installing engine trim panel", page 7](#) .
- Remove cover for connection fitting, to do so release lateral retaining clasps -arrows-.

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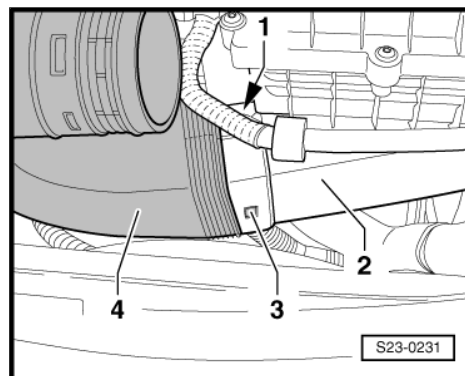


- Release screws -arrows- for connection fitting -1- and take connecting hose -2- out of the guide.





- Press in catch pegs -1- and -3- and pull off connecting hose -4- from air filter housing -2-.



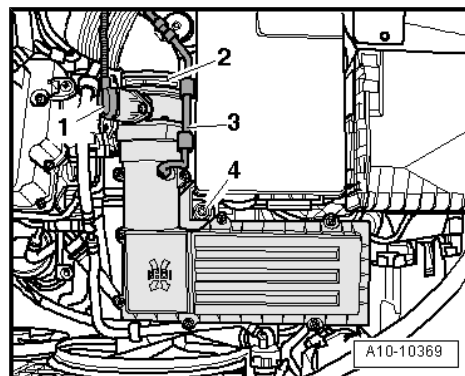
- Unplug connector -1- from air mass meter - G70- .
- Detach vacuum hose -3- and intake hose -2-.
- Slacken screw -4- and remove air filter housing.

#### Remove intake hose

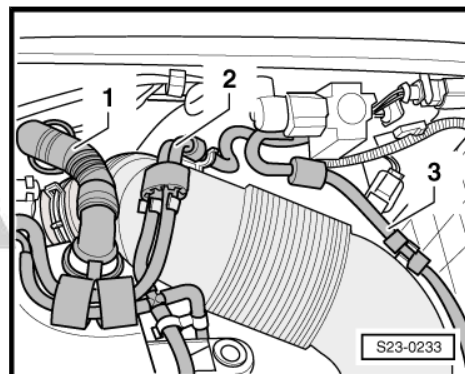


#### Note

*Due to the poor access of the pliers for spring strap clamps to the bottom intake hose it is preferable to remove the inlet connection from the exhaust gas turbocharger.*



- Unclip vacuum lines -2- and -3- from intake hose.
- Remove connecting pipe for crankcase ventilation -1-.



- Unscrew bolt -2-.
- Swivel the inlet connection -3- in the direction of the arrow -A- and remove it with the intake hose -1-.

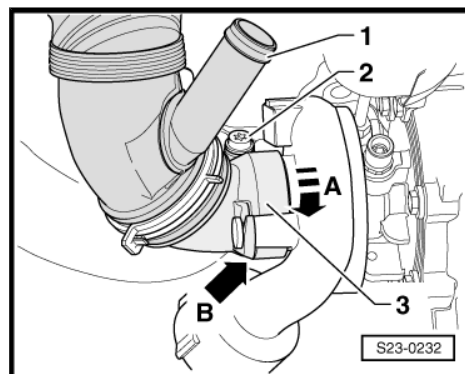
#### Installing

Assembly is carried out in the reverse order. When installing, observe the following:



#### Note

- ♦ *Renew O-ring.*
- ♦ *When installing the inlet connection -3- on the exhaust gas turbocharger, make sure that the inlet connection is correctly seated on the bolt arrow -B-.*



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## 4 Engine control unit

⇒ [“4.1 Removing and installing engine control unit J623 Octavia II”, page 309](#)

⇒ [“4.2 Removing and installing engine control unit J623 Superb II, Yeti”, page 310](#)

### 4.1 Removing and installing engine control unit - J623- Octavia II



#### Note

*If the engine control unit must be replaced, connect the ⇒ Vehicle diagnostic tester and in “perform the replace engine control unit” targeted fault finding.*

#### Special tools and workshop equipment required

- ◆ Body saw e.g. -V.A.G 1523 A-

#### Removing

- Switch off ignition.
- Remove bulkhead plenum chamber -arrows- ⇒ Body work; Rep. gr. 66 .

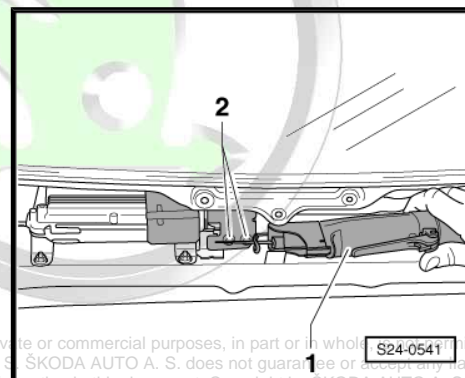
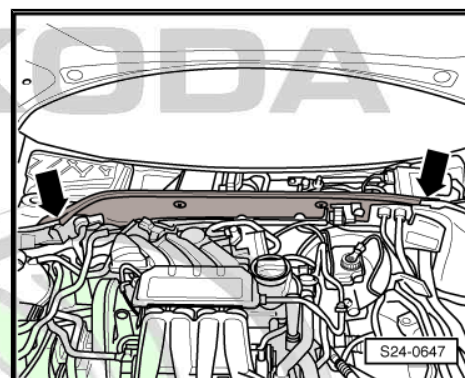
#### For vehicles with protective housing

- Cut with body saw -1- a slot for the cross-head screwdriver in the heads of the pull-off screws -2-.



#### Note

- ◆ *It must be sawed twice with the body saw, so that the slot is wide enough, in order to unscrew the screws with a suitable screwdriver.*
- ◆ *The pull-off screws until are inserted with locking agent.*
- Unscrew screws -2-.



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- Lift locking tab of protective cover with a cross-head screw-driver.
- Push the protective cover in the -direction of the arrow- out of the bracket for engine control unit.

**Continued for all vehicles**

- Disconnect front plug -1- and remove from engine control unit.



- Lever off retaining bracket -2- slightly.
- Push engine control unit out of the bracket -arrow-.
- Disconnect rear plug and remove from engine control unit.

**Installing**



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*For vehicles with protective cover, the metal swarfs must be suctioned out of the plenum chamber before installing the engine control unit.*

- Connect rear plug to engine control unit and lock.
- Push engine control unit into the bracket and lock the retaining bracket -2-.
- Connect front plug to engine control unit and lock.

**For vehicles with protective housing**

- Fasten protective cover with new pull-off screws (before tightening align the protective cover in such a way that it does not come into contact with the surrounding components)

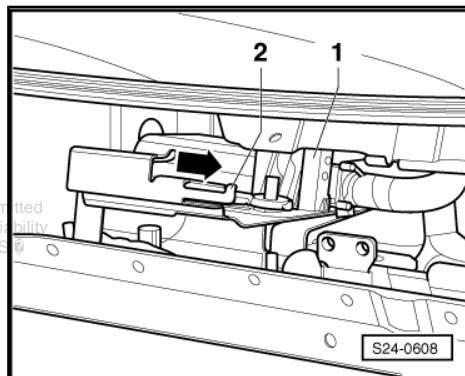
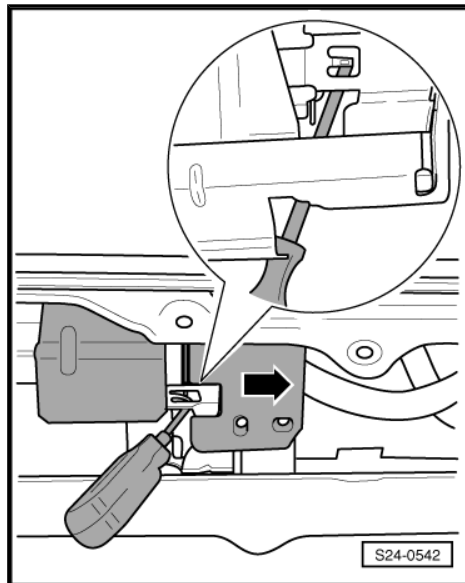
**Continued for all vehicles**

- Install the bulkhead plenum chamber ⇒ Body Work; Rep. gr. 66 .

## 4.2 Removing and installing engine control unit - J623- Superb II, Yeti

**Special tools and workshop equipment required**

- ♦ Body saw, e.g. -V.A.G 1523 A-





#### Note

- ◆ *In order to unplug the plugs from the control unit, the control unit must always be removed.*
- ◆ *If the engine control unit is replaced, the ⇒ Vehicle diagnostic tester must be connected and the function "Replace engine control unit" must be carried out.*

#### Removing

- Switch off ignition.

#### Vehicles Superb II

- Remove plenum chamber cover ⇒ Body Work; Rep. gr. 66 .

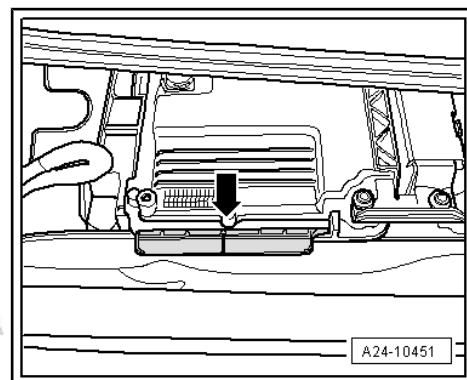
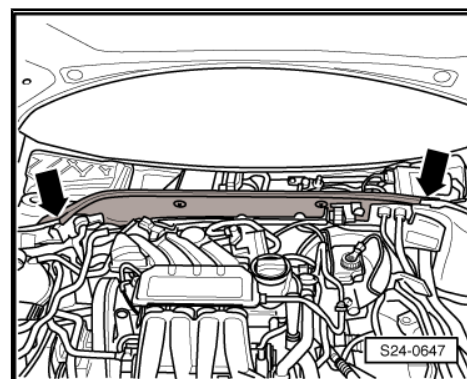
#### Vehicles Yeti

- Remove bulkhead plenum chamber -arrows- ⇒ Body work; Rep. gr. 66 .

#### Continued for all vehicles

- Open retaining clip -arrow- and remove the engine control unit - J623- .

#### Vehicles with protective cover for plug connections



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- Cut with body saw a slot for the cross-head screwdriver in the heads of the pull-off screws -3- and -4-.



**Note**

- ♦ *It must be sawed twice with the body saw, so that the slot is wide enough, in order to be able to unscrew the screws with a suitable screwdriver.*
- ♦ *The pull-off screws until are inserted with locking agent.*
- Unscrew the screws and remove the protective cover for the plug connections -2- and -5-.

**Continued for all vehicles**

- Unlock both plug connectors at engine control unit and remove them.

**Installing**

- Connect both plugs and lock.

**Vehicles with protective cover for plug connections**

- Fasten protective cover with new pull-off screws.
- Tighten pull-off screws evenly until the screw heads are pulled off.

**Continued for all vehicles**

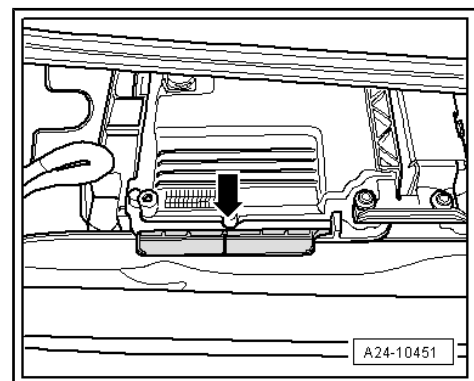
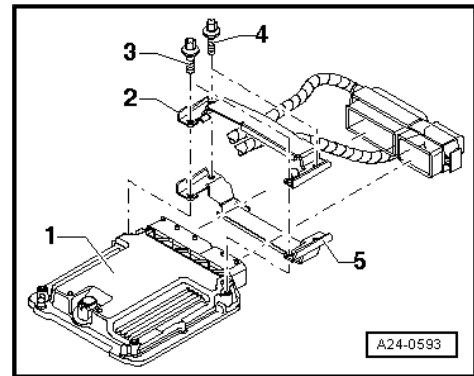
- Push engine control unit into the bracket and lock with retaining clip -arrow-.

**Vehicles Superb II**

- Install the plenum chamber cover ⇒ Body Work; Rep. gr. 66 .

**Vehicles Yeti**

- Install the bulkhead plenum chamber ⇒ Body Work; Rep. gr. 66 .



## 26 – Exhaust system

### 1 Removing and installing parts of the exhaust system

⇒ [“1.1 Summary of components - Pre-exhaust pipe with diesel particle filter Octavia II, Superb II, Yeti with engine identification characters CEGA, CBBB”, page 313](#)

⇒ [“1.2 Summary of components - Pre-exhaust pipe with diesel particle filter Yeti with engine identification characters CBDB”, page 315](#)

⇒ [“1.3 Replacing the exhaust gas pressure sensor 1 G450”, page 317](#)

⇒ [“1.4 Summary of components - Middle and rear part of the exhaust system Octavia II”, page 318](#)

⇒ [“1.5 Summary of components - Middle and rear part of the exhaust system Superb II”, page 320](#)

⇒ [“1.6 Summary of components - Middle and rear part of the exhaust system Yeti”, page 321](#)

⇒ [“1.7 Removing and installing pre-exhaust pipe with diesel particle filter”, page 321](#)

⇒ [“1.8 Replacing middle or rear part of the exhaust system”, page 326](#)

⇒ [“1.9 Align exhaust system free of stress”, page 327](#)

⇒ [“1.10 Inspecting the exhaust system for leaks”, page 327](#)



#### Note

- ◆ *The decoupling element in the pre-exhaust pipe should not be bent by more than 10° - risk of damage.*
- ◆ *Secure the decoupling element with the transport security - T10404- against overtensioning -arrow-.*
- ◆ *Replace the gaskets and the self-locking nuts.*
- ◆ *When performing installation work on the exhaust system, make sure the exhaust system is not mounted under tension and has adequate clearance from the vehicle body. If necessary, slacken the clamping sleeve and align the exhaust system so as to create all round adequate clearance to the body and so that the weight is evenly distributed over the hangers.*

### 1.1 Summary of components - Pre-exhaust pipe with diesel particle filter Octavia II, Superb II, Yeti with engine identification characters CEGA, CBBB

The exhaust turbocharger and the exhaust manifold are one component part; remove and install

⇒ [“1.2 Removing and installing exhaust gas turbocharger”, page 240](#).

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**1 - Screw**

- ☐ 8 Nm

**2 - Exhaust gas pressure sensor 1 - G450-**



**Caution**

***Risk of damage!**  
The exhaust gas pressure sensor 1 - G450- is very sensitive and must only be removed and replaced complete with bracket and hoses.*

***! must not touch somewhere when laying it down with the bracket.***

- ☐ Replace  
⇒ "1.3 Replacing the exhaust gas pressure sensor 1 G450", page 317

**3 - Nut**

- ☐ 9 Nm

**4 - Heat shield**

**5 - Lambda probe - G39-**

- ☐ the thread of new lambda probes must be coated with assembly paste
- ☐ for re-used lambda probe, only coat the thread with hot bolt paste - G 052 112 A3- ; the hot bolt paste - G 052 112 A3- must not get into the slots of the probe body
- ☐ 50 Nm

**6 - Exhaust gas temperature sender 4 - G648-**

- ☐ the thread of new temperature transmitters must be coated with assembly paste
- ☐ Grease only the thread with hot bolt paste - G 052 112 A3- for re-used temperature sender.
- ☐ 45 Nm

**7 - Seal**

- ☐ Replace after removal
- ☐ Check fitting position

**8 - Fixing clamp**

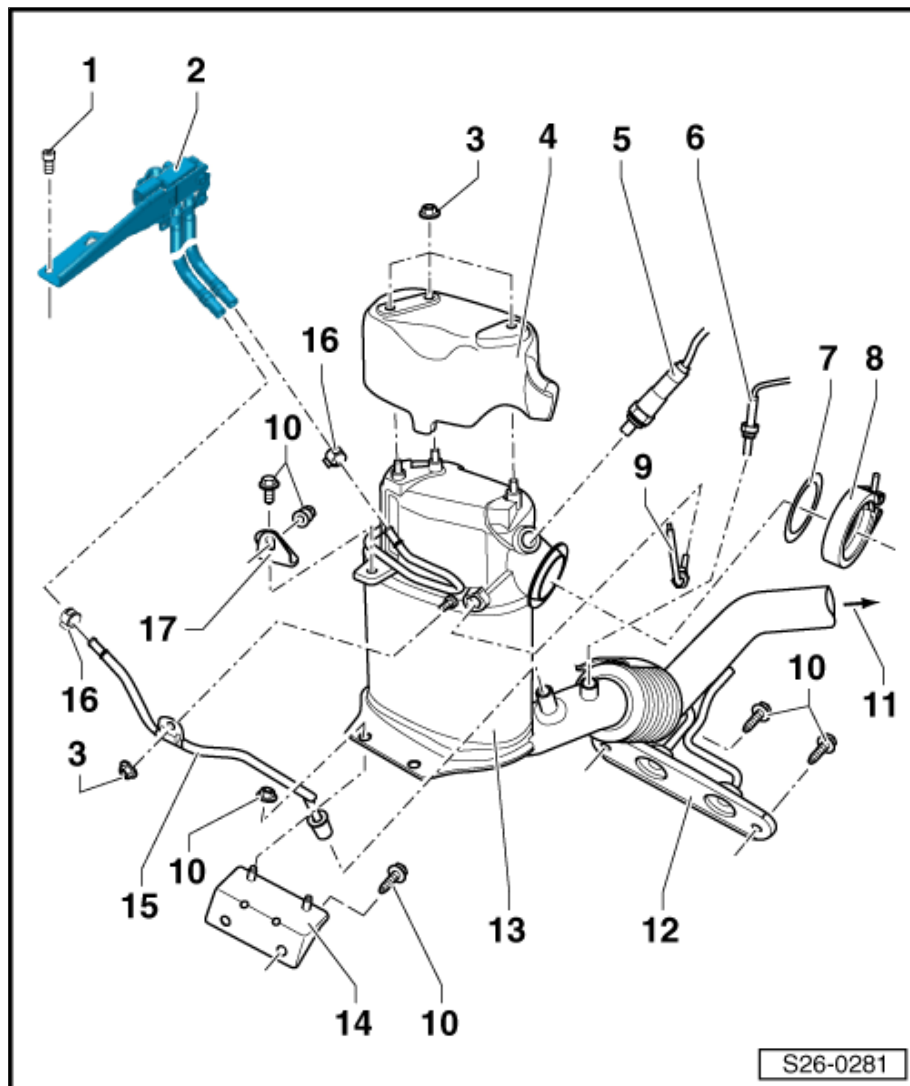
- ☐ Replace after removal
- ☐ 7 Nm

**9 - Exhaust gas temperature sender 3 - G495-**

- ☐ the thread of new temperature transmitters must be coated with assembly paste
- ☐ Grease only the thread with hot bolt paste - G 052 112 A3- for re-used temperature sender.
- ☐ 45 Nm

**10 - Screw**

- ☐ 25 Nm







#### 11 - to middle part of exhaust system

#### 12 - Hanger

- ☐ Replace if damaged.

#### 13 - Exhaust pipe

- ☐ with diesel particle filter and oxidation catalytic converter
- ☐ after replacing, the adaptation of the ash mass balance must be set to "0" ⇒ Vehicle diagnostic tester
- ☐ Removing and installing  
⇒ ["1.7 Removing and installing pre-exhaust pipe with diesel particle filter", page 321](#)

#### 14 - Mounting bracket

- ☐ screwed onto the cylinder block

#### 15 - Control line

- ☐ 45 Nm

#### 16 - Clamp

- ☐ Replace after removal

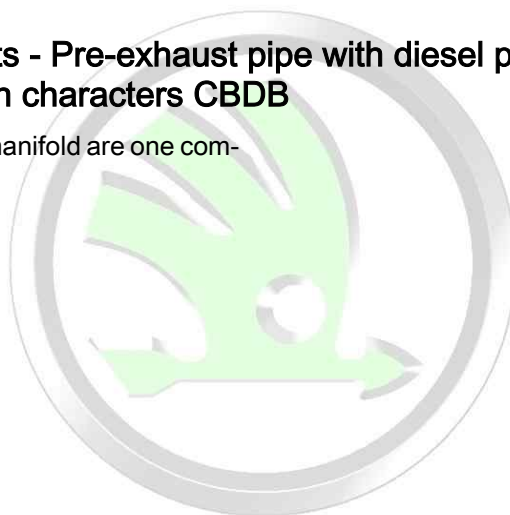
#### 17 - Bracket at top

- ☐ for diesel particle filter
- ☐ bolted to the cylinder head

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## 1.2 Summary of components - Pre-exhaust pipe with diesel particle filter Yeti with engine identification characters CBDB

The exhaust turbocharger and the exhaust manifold are one component part; remove and install



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⇒ "1.2 Removing and installing exhaust gas turbocharger",  
page 240 .

- 1 - Screw
  - ☐ 8 Nm
- 2 - Mounting bracket
  - ☐ for hoses
- 3 - Screw
  - ☐ 5 Nm
- 4 - Screw
  - ☐ 8 Nm
- 5 - Exhaust gas pressure sensor 1 - G450-

**Caution**

**Risk of damage!**  
The exhaust gas pressure sensor 1 - G450- is very sensitive and therefore it must be treated with utmost care. It must not touch somewhere when laying it down.

Detach the hoses from the exhaust gas pressure sensor 1 - G450- only when replacing it.

- ☐ Replace
  - ⇒ "1.3 Replacing the exhaust gas pressure sensor 1 G450", page 317

- 6 - Mounting bracket
  - ☐ Pressure sensor 1 for exhaust gas - G450-

- 7 - Spring strap clamps

- 8 - Hose

- 9 - Nut
  - ☐ 9 Nm

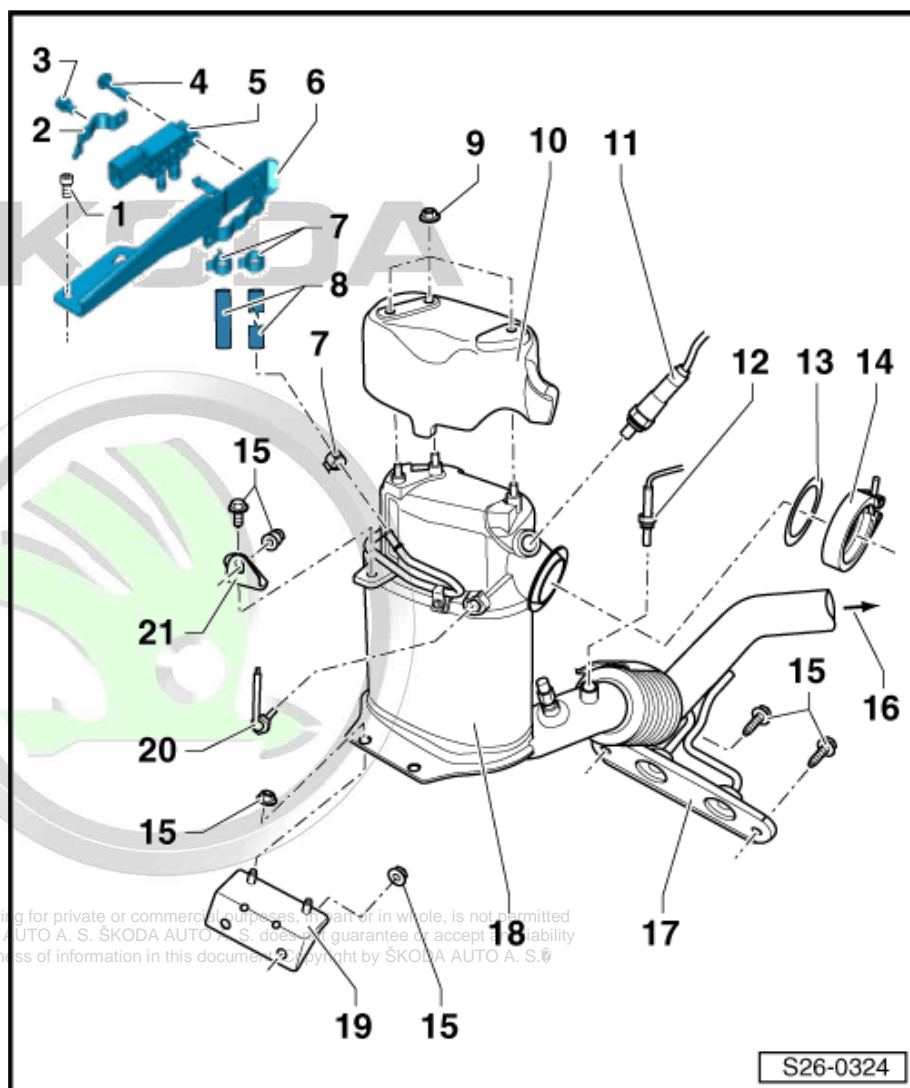
- 10 - Heat shield

- 11 - Lambda probe - G39-

- ☐ the thread of new lambda probes must be coated with assembly paste
- ☐ when installing an already used lambda probe, only coat the thread with hot bolt paste - G 052 112 A3- ; the hot bolt paste - G 052 112 A3- must not get into the slots of the probe body
- ☐ use spanner set 17 mm - T10395- for removing and installing
- ☐ 50 Nm

- 12 - Exhaust gas temperature sender 4 - G648-

- ☐ the thread of new temperature transmitters must be coated with assembly paste
- ☐ coat thread with hot bolt paste - G 052 112 A3- before installing a used sender
- ☐ use spanner set 17 mm - T10395- for removing and installing
- ☐ 45 Nm



### 13 - Seal

- ☐ Replace after removal
- ☐ Check fitting position

### 14 - Fixing clamp

- ☐ Replace after removal
- ☐ 7 Nm

### 15 - Screw

- ☐ 25 Nm

### 16 - to middle part of exhaust system

### 17 - Hanger

- ☐ Replace if damaged.

### 18 - Exhaust pipe

- ☐ with diesel particle filter and oxidation catalytic converter
- ☐ after replacing, the adaptation of the ash mass balance must be set to "0" ⇒ Vehicle diagnostic tester
- ☐ Removing and installing  
⇒ ["1.7 Removing and installing pre-exhaust pipe with diesel particle filter", page 321](#)

### 19 - Mounting bracket

- ☐ screwed onto the cylinder block

### 20 - Exhaust gas temperature sender 3 - G495-

- ☐ the thread of new temperature transmitters must be coated with assembly paste
- ☐ coat thread with hot bolt paste - G 052 112 A3- before installing a used sender
- ☐ use spanner set 17 mm - T10395- for removing and installing
- ☐ 45 Nm

### 21 - Mounting bracket

- ☐ screwed onto the cylinder head

## 1.3 Replacing the exhaust gas pressure sensor 1 - G450-

The exhaust gas pressure sensor 1 - G450- determines the volumetric efficiency of the particle filter volume. It is connected to the measuring point behind the diesel particle filter via a pressure line and to the diesel particle filter via another control line.

- If the lines or hoses are clogged with soot, which significantly constricts their cross section, then the sender together with the bracket and the connected hoses must be completely replaced.



#### Caution

***The exhaust gas pressure sensor 1 - G450- is very sensitive to impacts and leaks.***

- ◆ ***Therefore the hoses of the sender must only be removed if the sender is damaged.***
- ◆ ***Furthermore there is the risk that the hose connections break off when the hoses are removed.***

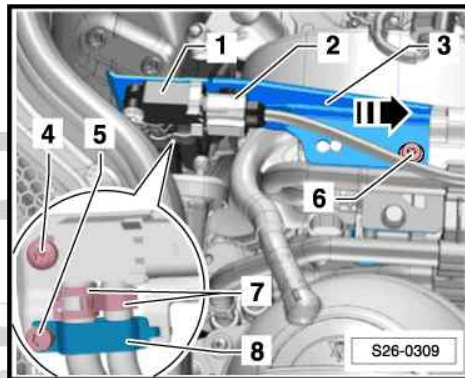
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### Removing

- Remove engine cover  
⇒ ["1.1 Removing and installing engine trim panel", page 7](#) .



- Disconnect plug connection -2- at exhaust gas pressure sensor 1 - G450- -1-.
- Screw out screw -6- and detach bracket -3- with exhaust gas pressure sensor 1 - G450- in -direction of arrow- from the bracket for the additional fuel pump - V393- .
- Release screw -5- and remove bracket -8-.
- Slacken the spring strap clamps -7- and detach the hoses from the connection fittings of the exhaust gas pressure sensor 1 - G450- -1-.
- Screw out screw -4- and loosen the exhaust gas pressure sensor 1 - G450- -1- from the bracket -3-.



### Installing

Assembly is carried out in the reverse order. When installing, observe the following:



#### Note

- ◆ *Before installing, blow through the pressure lines to the exhaust gas pressure sensor 1 - G450- with air in order to avoid blockages.*
- ◆ *Pay attention to the tight fit and leaktightness of the connections.*
- Perform an adaptation after replacing the exhaust gas pressure sensor 1 - G450- ➔ Vehicle diagnostic tester.

The work procedure for the adaptation is described in the “Targeted fault finding”. It is also described under “Targeted functions”.

- Select the correct vehicle in the “Targeted fault finding”.
- Press **[Skip]** button.
- Press “Selected Functions/Components”.
- Select **[Drive]**.
- Select “01 - Self-diagnosable systems”.
- Select “01 - Engine electronics J623”.
- “Select 01 - Engine electronics, functions”.
- Select “01 - Erase initialisation values (Rep. Gr. 21 - 28)”.

### Tightening torques

- ◆ Fixing screws Octavia II, Superb II, Yeti with engine identification characters CEGA  
⇒ [“1.1 Summary of components - Pre-exhaust pipe with diesel particle filter Octavia II, Superb II, Yeti with engine identification characters CEGA, CBBB”, page 313](#) .
- ◆ Fixing screws Yeti with engine identification characters CBDB  
⇒ [“1.2 Summary of components - Pre-exhaust pipe with diesel particle filter Yeti with engine identification characters CBDB”, page 315](#) .

## 1.4 Summary of components - Middle and rear part of the exhaust system Octavia II

**1 - from pre-exhaust pipe**

**2 - Clamping sleeve**

- ☐ align exhaust system free of stress before fitting on  
⇒ ["1.9 Align exhaust system free of stress", page 327](#)
- ☐ Tighten screwed connections uniformly

**3 - Middle part of exhaust system**

- ☐ for first equipment building unit with rear part of exhaust gas system, replace individually when carrying out repairs
- ☐ Replace  
⇒ ["1.8 Replacing middle or rear part of the exhaust system", page 326](#)
- ☐ Installing the exhaust system without tension  
⇒ ["1.9 Align exhaust system free of stress", page 327](#)

**4 - Retaining strap**

- ☐ Replace if damaged.
- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts

**5 - Rear tunnel bridge**

**6 - Nut**

- ☐ 23 Nm

**7 - Rear part of exhaust system**

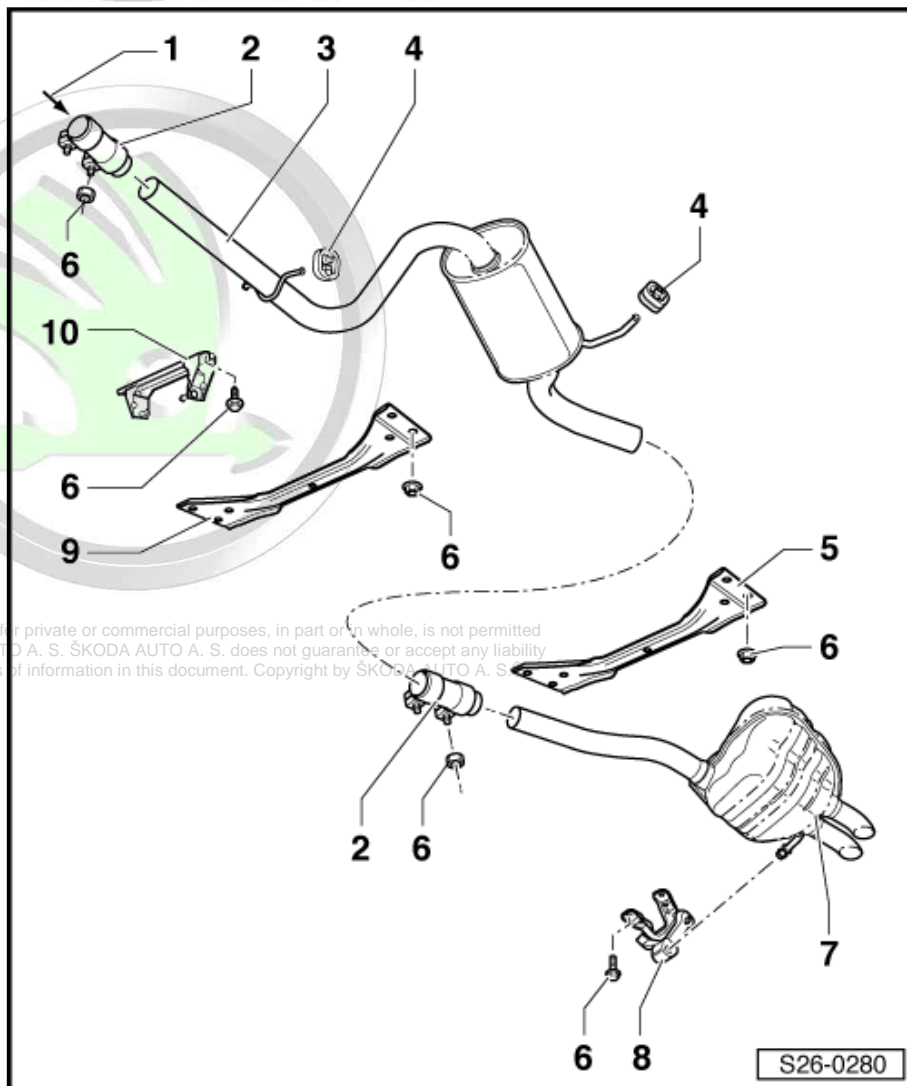
- ☐ for first equipment building unit with middle part of exhaust gas system, replace individually when carrying out repairs
- ☐ Replace ⇒ ["1.8 Replacing middle or rear part of the exhaust system", page 326](#)
- ☐ Installing the exhaust system without tension ⇒ ["1.9 Align exhaust system free of stress", page 327](#)

**8 - Hanger**

- ☐ Replace if damaged.

**9 - Front tunnel bridge**

**10 - Hanger**







## 1.5 Summary of components - Middle and rear part of the exhaust system Superb II

### 1 - Rear part of exhaust system

- ☐ can only be replaced complete with middle part

### 2 - Hanger

- ☐ Replace if damaged.

### 3 - Screw and nut

- ☐ 23 Nm

### 4 - Rear tunnel bridge

### 5 - Retaining strap

- ☐ Replace if damaged.
- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts

### 6 - Nut

- ☐ 23 Nm

### 7 - Clamping sleeve

- ☐ align exhaust system free of stress before fitting on  
⇒ ["1.9 Align exhaust system free of stress", page 327](#)
- ☐ Tighten screwed connections uniformly

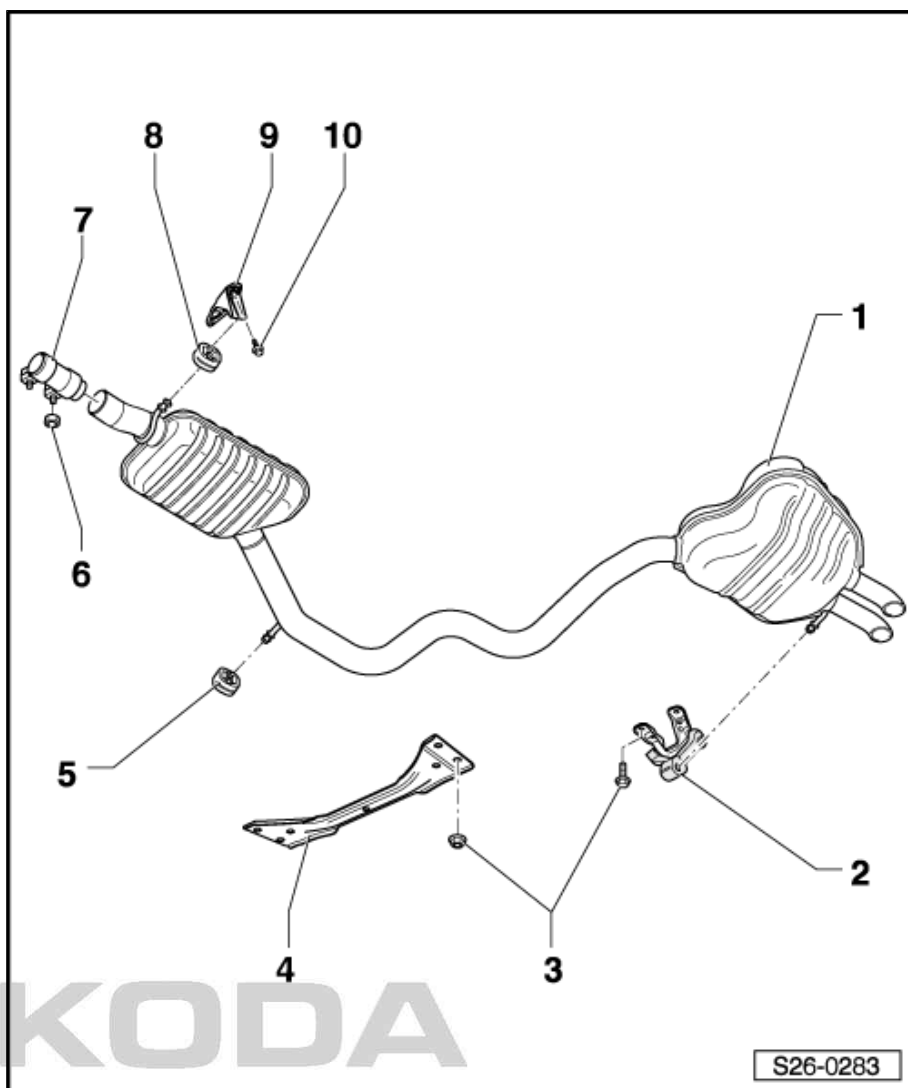
### 8 - Retaining strap

- ☐ Replace if damaged.
- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts

### 9 - Hanger

### 10 - Screw

- ☐ 23 Nm



## 1.6 Summary of components - Middle and rear part of the exhaust system Yeti

### 1 - Clamping sleeve

- ☐ align exhaust system free of stress before tightening  
⇒ ["1.9 Align exhaust system free of stress", page 327](#)
- ☐ Tighten screwed connections uniformly
- ☐ 23 Nm

### 2 - Middle and rear part of the exhaust system

- ☐ for first equipment a building unit, replace completely when carrying out repairs
- ☐ Installing the exhaust system without tension  
⇒ ["1.9 Align exhaust system free of stress", page 327](#)

### 3 - Hanger

### 4 - Screw

- ☐ 23 Nm

### 5 - Retaining strap

- ☐ Replace if damaged.
- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts

### 6 - Retaining strap

- ☐ Replace if damaged.

### 7 - Retaining strap

- ☐ Replace if damaged.
- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts

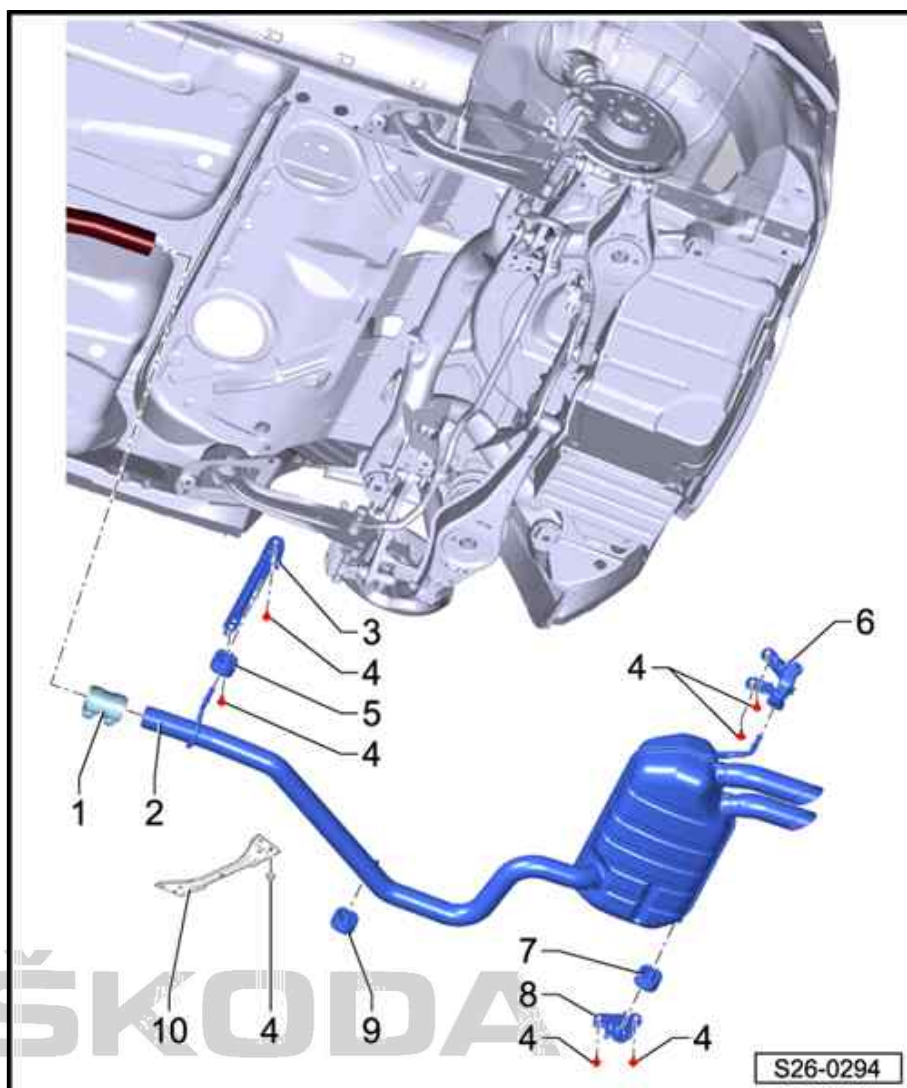
### 8 - Bracket for the exhaust system

- ☐ firmly riveted with the heat protection plate of the fuel tank

### 9 - Retaining strap

- ☐ Replace if damaged.
- ☐ Observe part number ⇒ ETKA - Electronic Catalogue of Original Parts

### 10 - Tunnel bridge



## 1.7 Removing and installing pre-exhaust pipe with diesel particle filter

### Special tools and workshop equipment required

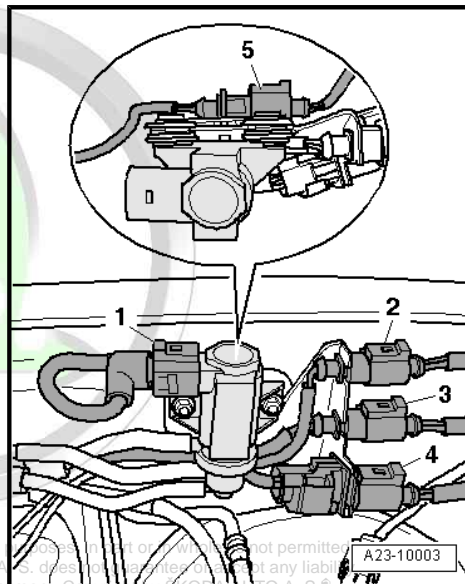
- ◆ Ratchet ring wrench - T10384-
- ◆ Lambda probe open ring spanner set
- ◆ Tool set SW 17 - T10395-
- ◆ Transport security - T10404-



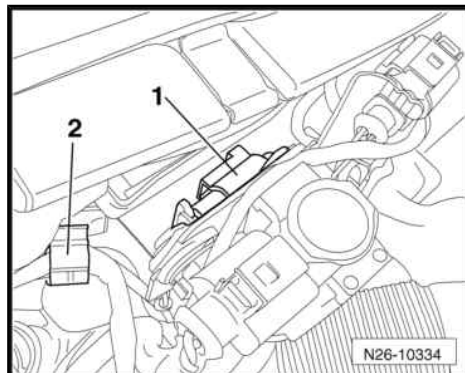
- ◆ Hot bolt paste - G 052 112 A3-

## Removing

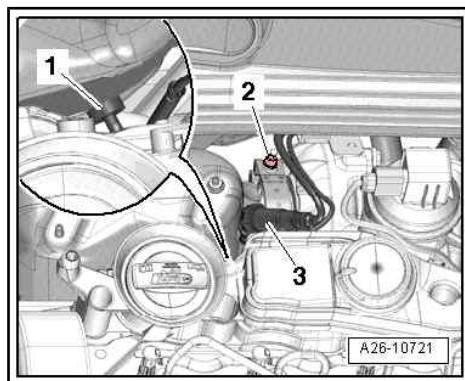
- Remove engine cover  
⇒ ["1.1 Removing and installing engine trim panel", page 7](#) .
- Disconnect the following plug connections and disconnect the lines:
- ◆ Position 2: exhaust gas temperature sender 4 - G648-
- ◆ Position 4: lambda probe - G39-



- Disconnect the plug for the exhaust gas temperature sender 3 - G495- ( temperature sender downstream particle filter - G527- ) -1- (fastened behind the bracket).
- Pull the plug connections out of the support and guide the lines out of the support at the front face -2- and at the exhaust gas turbocharger.



- Remove warm-type clamp -2- between diesel particle filter and exhaust turbocharger.
- Remove lambda probe - G39- -3-.



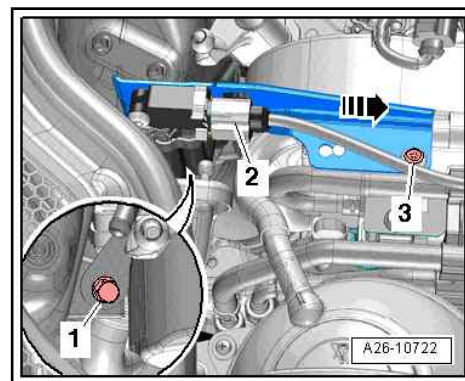
- Disconnect plug connection -2- at exhaust gas pressure sensor 1 - G450- .
- Unscrew screws -1- (bracket on cylinder head) and -3- and remove the bracket with the exhaust gas pressure sensor 1 - G450- from the bracket of the additional fuel pump in -direction of arrow-.
- Place the bracket with the exhaust gas pressure sensor 1 - G450- to the rear.



#### Caution

#### *Risk of damage!*

- ◆ *The exhaust gas pressure sensor 1 - G450- is very sensitive and must therefore not touch somewhere when laying it down with the bracket.*



- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .
- Remove assembly carrier with steering gear ⇒ Chassis; Rep. gr. 40 .

#### Vehicles with auxiliary heating

- Remove exhaust pipe of auxiliary heating (only for vehicles with extended exhaust pipe) ⇒ Heating, Air Conditioning; Rep. gr. 82 .

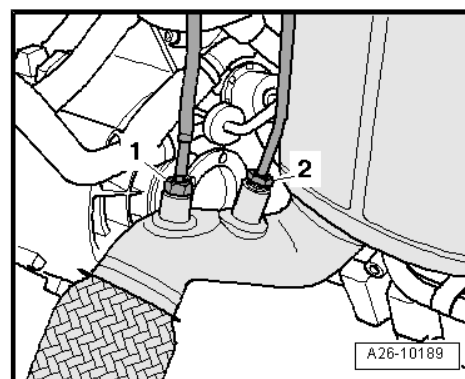
#### Continued for all vehicles

- Unbolt heat shield for right drive shaft.
- Remove drive shaft to the right ⇒ Chassis; Rep. gr. 40 .
- Unscrew the exhaust gas temperature sender 4 - G648- -1- from the exhaust pipe.
- Detach clamping sleeve. Leave it in its position.

#### On vehicles with four-wheel drive

- Remove right flange shaft from angle gearbox ⇒ Gearbox; Rep. gr. 39 ⇒ Chapter "Replacing gasket ring for right flange shaft".

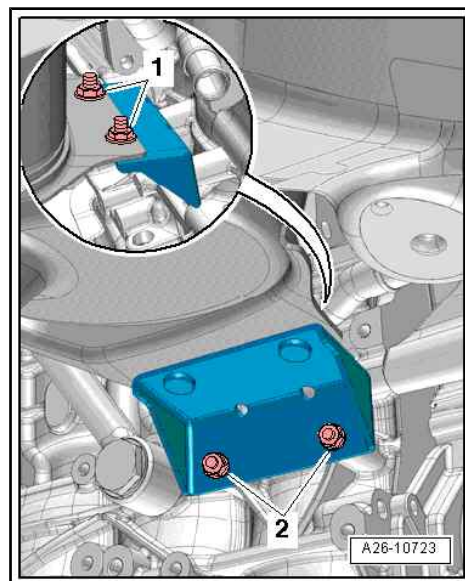
#### Continued for all vehicles







- Release nuts -1- using the ratchet ring wrench - T10384- .
- Release nuts -2- and remove bracket for diesel particle filter.



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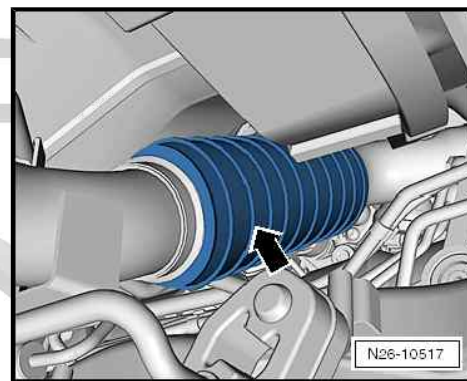


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## Note

- ◆ *The assistance of a second mechanic is required for removing the pre-exhaust pipe.*
  - ◆ *Make sure that the electrical cables and the components are not damaged.*
  - ◆ *The decoupling element in the pre-exhaust pipe should not be bent by more than 10° - risk of damage.*
  - ◆ *Do not expose the decoupling element to tension, do not damage the protective wire mesh.*
  - ◆ *Secure the decoupling element with the transport security - T10404- against over-tensioning -arrow-.*
- Push clamping sleeve to the rear.
  - Remove the diesel particle filter downwards, to do so slightly push engine/gearbox assembly to the front.



## Installing

## Note

- ◆ *The decoupling element in the pre-exhaust pipe should not be bent by more than 10° - risk of damage.*
- ◆ *Do not expose the decoupling element to tension, do not damage the protective wire mesh.*
- ◆ *Secure the decoupling element with the transport lock - T10404- to prevent over-tensioning.*
- ◆ *Replace gasket and clamp for diesel particle filter.*

Further installation occurs in reverse order. Pay attention to the following:

- First fasten the diesel particle filter loosely to the exhaust gas turbocharger and then fasten to the bottom bracket.
- Align exhaust system free of stress  
⇒ ["1.9 Align exhaust system free of stress", page 327](#) .

After replacing the diesel particle filter, the adaptation of the ash mass balance must be set to "0" ⇒ Vehicle diagnostic tester.

## On vehicles with four-wheel drive

- Check gear oil level in the angle gearbox ⇒ Gearbox; Rep. gr. 34 .

## Tightening torques

- ◆ Summary of components - Pre-exhaust pipe with diesel particle filter Octavia II, Superb II, Yeti with engine identification characters CEGA  
⇒ ["1.1 Summary of components - Pre-exhaust pipe with diesel particle filter Octavia II, Superb II, Yeti with engine identification characters CEGA, CBBB", page 313](#) .
- ◆ Summary of components - Pre-exhaust pipe with diesel particle filter Yeti with engine identification characters CBDB  
⇒ ["1.2 Summary of components - Pre-exhaust pipe with diesel particle filter Yeti with engine identification characters CBDB", page 315](#) .

## 1.8 Replacing middle or rear part of the exhaust system

### Special tools and workshop equipment required

- ◆ Body saw , e.g. -V.A.G 1523 A- or chain pipe cutter , e.g. -VAS 6254-
- ◆ Protective goggles

### Work procedure



#### Note

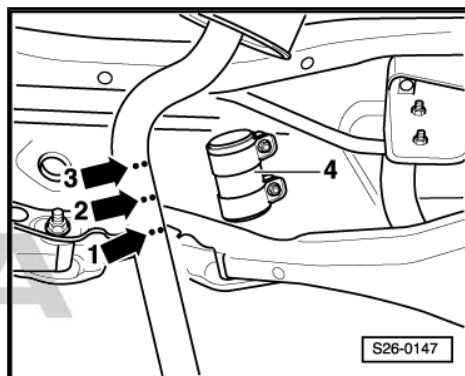
- ◆ For individually replacing the middle or rear part of the exhaust system, a separation point is provided in the connecting pipe.
- ◆ The separation point is marked by indentations on the circumference of the exhaust pipe.



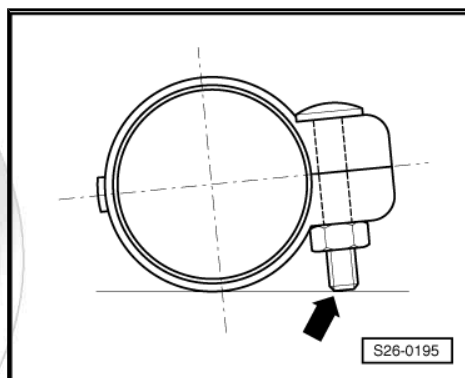
#### WARNING

*To avoid injury from metal shavings, wear eye protection and protective clothing.*

- Cut exhaust pipe at right angles at the separation point arrow -2-.



- When installing, position clamping sleeve -4- at the side markings arrow -1- and arrow -3-.
- Rotate the clamping sleeve so that the screw ends -arrow- do not protrude beyond the lower edge of the clamping sleeve.
- Align exhaust system in cold condition free of stress  
⇒ ["1.9 Align exhaust system free of stress", page 327](#) .
- Tighten the clamping sleeve to the specified tightening torque.



### Tightening torques

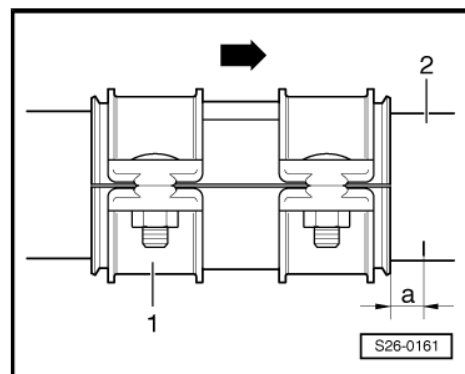
- ◆ Clamping sleeve Yeti  
⇒ ["1.6 Summary of components - Middle and rear part of the exhaust system Yeti", page 321](#)
- ◆ Clamping sleeve Superb II  
⇒ ["1.5 Summary of components - Middle and rear part of the exhaust system Superb II", page 320](#)
- ◆ Clamping sleeve Octavia II  
⇒ ["1.4 Summary of components - Middle and rear part of the exhaust system Octavia II", page 318](#)

## 1.9 Align exhaust system free of stress

- The exhaust system is aligned when cold.
- Slacken front clamping sleeve -1- and align to exhaust pipe -2- (-arrow- points in direction of travel).
- $-a- = 5 \text{ mm}$

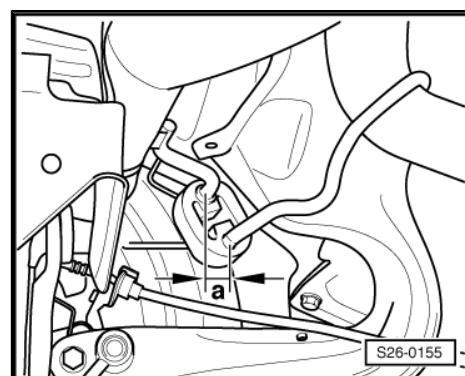
The fixing screws must be located on the right. The screws must not protrude beyond the bottom edge of the clamping sleeve.

- Tighten front screw by hand.



- Push the exhaust system so far forward until the initial load dimension  $-a-$  on the retaining strap at the middle part of the exhaust system is 9-11 mm.
- Evenly tighten the front screws of the clamping sleeve to the specified tightening torque.

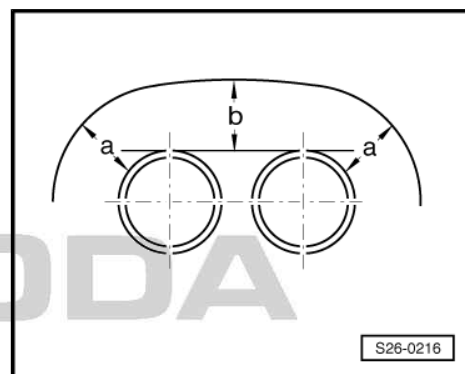
### Align exhaust tailpipes



- Align rear part of exhaust system in such a way that there is an equal distance  $-a-$  on the left and right between bumper opening and exhaust tailpipes.

At the same time there must be an equal distance  $-b-$  from the bumper opening to the exhaust tailpipes.

For centering, if necessary the hangers of the exhaust system must be loosened.



### Tightening torques

- ◆ Clamping sleeve Yeti  
⇒ [“1.6 Summary of components - Middle and rear part of the exhaust system Yeti”, page 321](#)
- ◆ Clamping sleeve Superb II  
⇒ [“1.5 Summary of components - Middle and rear part of the exhaust system Superb II”, page 320](#)
- ◆ Clamping sleeve Octavia II  
⇒ [“1.4 Summary of components - Middle and rear part of the exhaust system Octavia II”, page 318](#)

## 1.10 Inspecting the exhaust system for leaks

- Start engine and run in idle.
- Seal off exhaust tailpipes for the duration of the leak check (e.g. with cloth or plug).
- Inspect connection points of cylinder head/exhaust manifold, exhaust gas turbocharger/pre-exhaust pipe etc. for leaktightness by listening and visual inspection.
- Eliminate any leak found.



## 2 Exhaust gas recirculation system

⇒ "2.1 Summary of components - Exhaust gas recirculation with radiator", page 328

⇒ "2.2 Removing and installing the exhaust gas recirculation valve N18", page 330

⇒ "2.3 Removing and installing radiator for exhaust gas recirculation", page 332

⇒ "2.4 Check changeover of radiator for exhaust gas recirculation", page 334

⇒ "2.5 Test air-tightness of the radiator for exhaust gas recirculation", page 335



### Note

- ◆ *The exhaust gas recirculation system is operated by the engine control unit - J623- for EGR valve - N18- .*
- ◆ *The EGR valve - N18- consists of the mechanical valve, the EGR control motor - V338- and the EGR potentiometer - G212- .*
- ◆ *The electrically operated valve with cone-shaped valve plunger makes it possible to achieve different opening cross-sections at different valve strokes.*
- ◆ *Replace self-locking nuts.*

### 2.1 Summary of components - Exhaust gas recirculation with radiator

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# 1 - Vacuum line

- ☐ do not change bending form

# 2 - Heat shield collar

- ☐ Replace if damaged.

# 3 - Nut

- ☐ 9 Nm

# 4 - Radiator for exhaust gas recirculation

- ☐ with change-over flap
- ☐ Check change-over of radiator for exhaust gas recirculation  
⇒ ["2.4 Check change-over of radiator for exhaust gas recirculation", page 334](#)
- ☐ Removing and installing  
⇒ ["2.3 Removing and installing radiator for exhaust gas recirculation", page 332](#)
- ☐ After replacing, fill with fresh coolant  
⇒ ["1.3 Draining and filling coolant", page 163](#)

# 5 - Seal

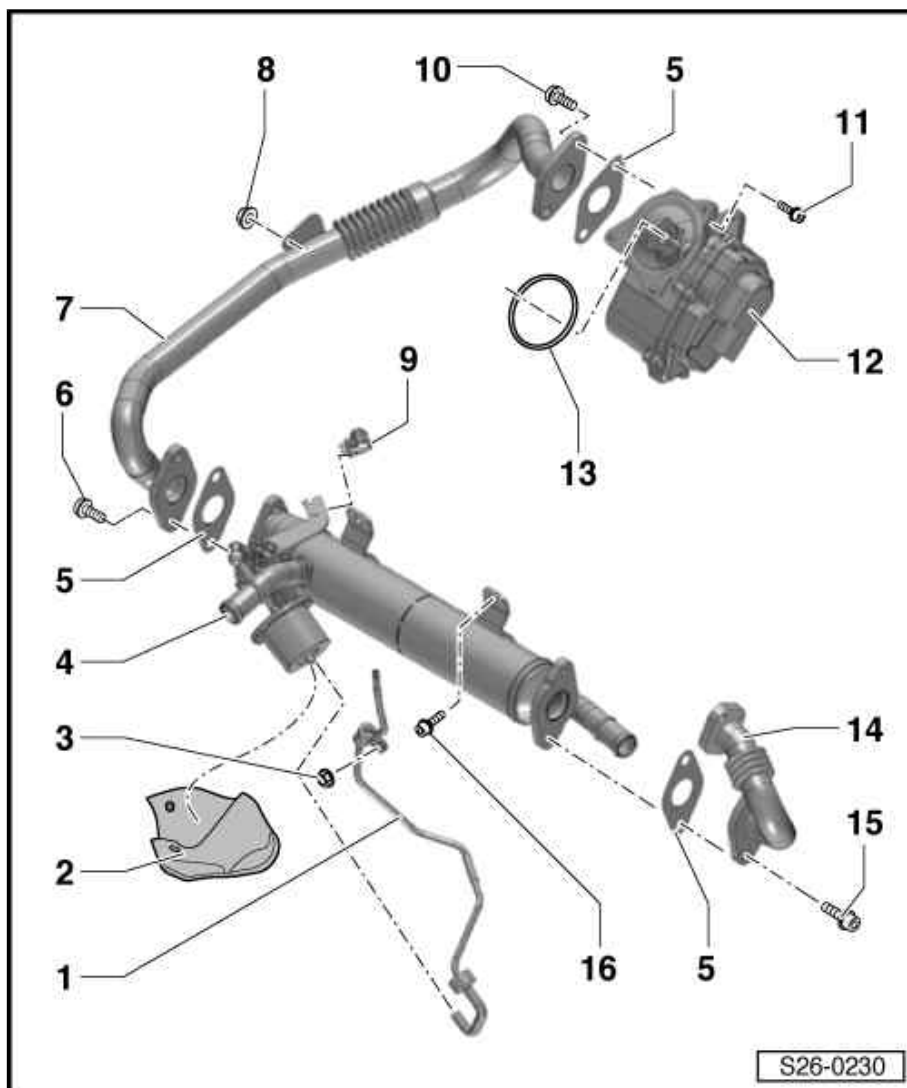
- ☐ Replace after removal

# 6 - Screw

- ☐ 22 Nm

# 7 - Connecting pipe

- ☐ for exhaust gas recirculation



## Caution

*Pay attention that the bellows of the connection pipe is not bent or overstretched. There is a risk of crack formation.*

# 8 - Nut

- ☐ 9 Nm

# 9 - Retaining clip

# 10 - Screw

- ☐ 22 Nm

# 11 - Screw

- ☐ 9 Nm

# 12 - Exhaust gas return valve - N18-

- ☐ consists of:

- ◆ mechanical valve (electrically operated)
- ◆ Exhaust gas recirculation control motor - V338-

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◆ Exhaust gas recirculation potentiometer - G212-

- ☐ Removing and installing

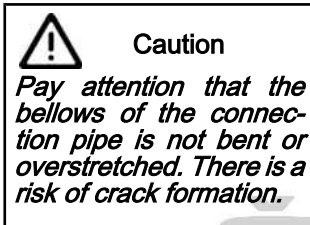
⇒ ["2.2 Removing and installing the exhaust gas recirculation valve N18", page 330](#)

13 - Sealing ring

- ☐ Replace after removal

14 - Connecting pipe

- ☐ for exhaust gas recirculation



15 - Screw

- ☐ 22 Nm

16 - Screw

- ☐ 10 Nm

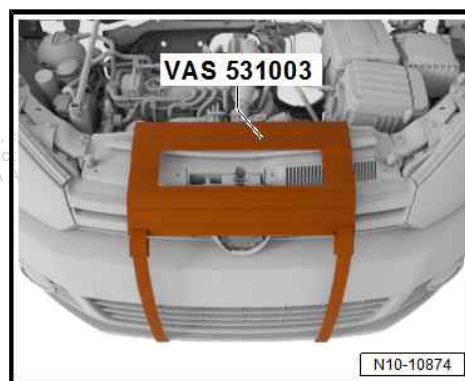
## 2.2 Removing and installing the exhaust gas recirculation valve - N18-

### Special tools and workshop equipment required

- ◆ Radiator protection mat - VAS 531003-

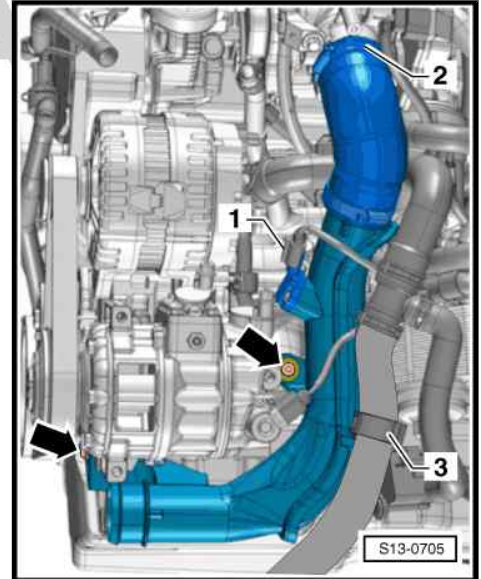
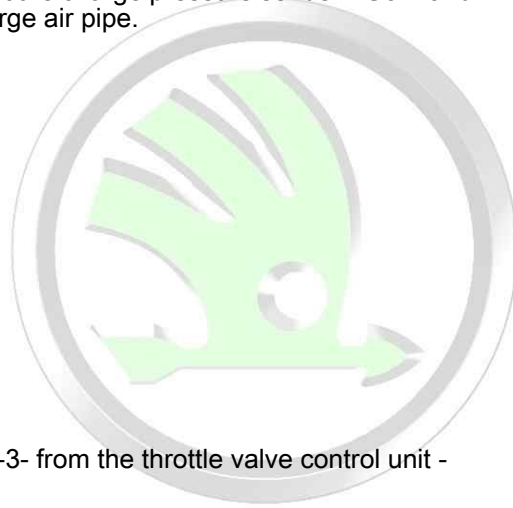
### Removing

- Remove fan shroud with radiator fans  
⇒ ["4.2 Removing and installing fan shroud for radiator fan", page 188](#) .
- Cover radiator with radiator protection mat - VAS 531003- .



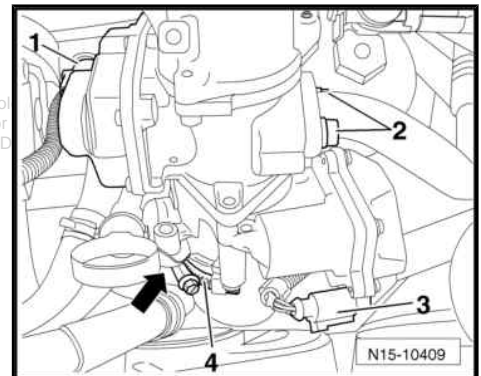
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- Unscrew screws -arrows-.
- Detach coolant hose -3-.
- Loosen hose clamp -2-.
- Disconnect plug -1- at the charge pressure sender - G31- and remove the right charge air pipe.

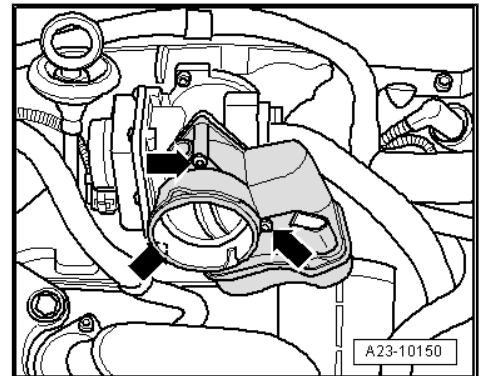


- Disconnect the plug -3- from the throttle valve control unit - J338- .

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- Remove screws -arrows- and remove the throttle flap control unit - J338- .





- Disconnect plug -1- on the exhaust gas recirculation valve - N18- .
- Screw out screws -2- and -3- and remove exhaust gas recirculation valve - N18- .

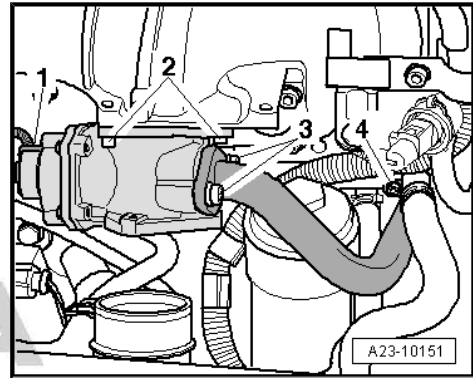
### Installing

Assembly is carried out in the reverse order. When installing, observe the following:



### Note

*Always replace gasket rings and seals.*



### Tightening torques

- ◆ Throttle valve control unit - J338-  
⇒ [“3.1 Summary of components - intake manifold”, page 302](#)
- ◆ Exhaust gas recirculation valve - N18-  
⇒ [“2.1 Summary of components - Exhaust gas recirculation with radiator”, page 328](#)
- ◆ Charge air pipe Octavia II  
⇒ [“2.1 Summary of components - Charge air cooler Octavia II”, page 255](#) .
- ◆ Charge air pipe Superb II  
⇒ [“2.2 Summary of components - Charge air cooler Superb II”, page 256](#) .
- ◆ Charge air pipe Yeti  
⇒ [“2.3 Summary of components - Charge air cooler Yeti”, page 257](#) .

## 2.3 Removing and installing radiator for exhaust gas recirculation

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### Special tools and workshop equipment required

- ◆ Hose clamps up to Ø 25 mm - MP7-602 (3094)-
- ◆ Catch pan , e.g. -VAS 6208-
- ◆ Old oil collecting and suction equipment , e.g. -V.A.G 1782-
- ◆ Pliers for spring-type clips

### Removing

**If you need to remove or replace the radiator for exhaust gas recirculation.**

- First inspect recirculation pump 2 - V178- ⇒ Vehicle diagnostic tester.

Only after the inspection of recirculation pump 2 - V178- was successful, should you begin to remove the radiator for exhaust gas recirculation.

A not OK recirculation pump 2 - V178- can be the cause of a faulty exhaust gas recirculation system.



### Caution

*When undertaking all installation work, particularly in the engine compartment because of its cramped construction, please observe the following:*

- ◆ Lay lines of all kinds (for example, for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.
- ◆ To avoid damage to lines/wiring, ensure sufficient clearance to all moving or hot components.

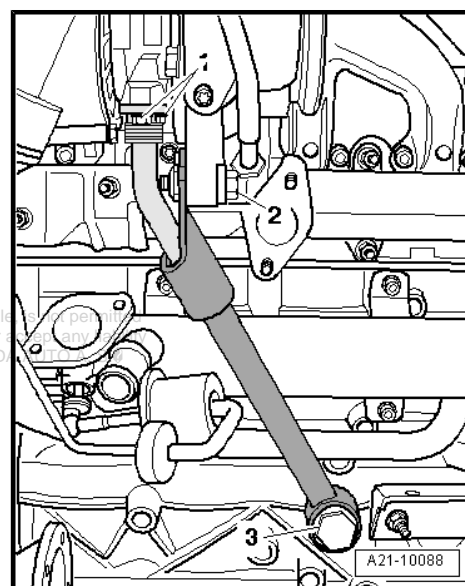
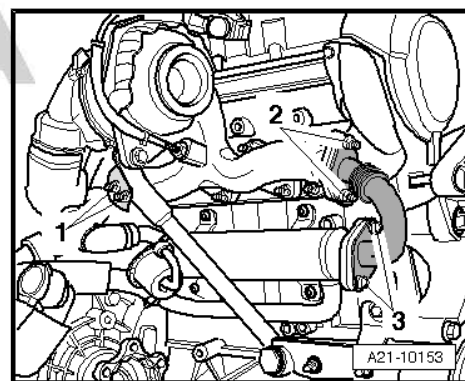
- Remove air filter housing with air mass meter - G70-  
⇒ [“3.5 Removing and installing air filter housing”, page 307](#) .
- Remove battery and battery tray ⇒ Electrical System; Rep. gr. 27 .
- Remove pre-exhaust pipe  
⇒ [“1.7 Removing and installing pre-exhaust pipe with diesel particle filter”, page 321](#) .
- Release nuts -2- and screws -3- and remove the connection pipe for exhaust gas recirculation.

### On vehicles with four-wheel drive

- Remove right flange shaft from angle gearbox ⇒ Gearbox; Rep. gr. 39 .

### Continued for all vehicles

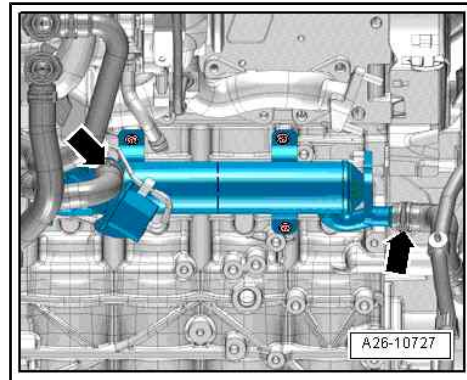
- Unscrew screws -1- and -2- and hollow screw -3-.
- Remove support for exhaust turbocharger with oil return-flow line.
- Collect escaping engine oil with the old oil collecting and suction equipment - V.A.G 1782- .



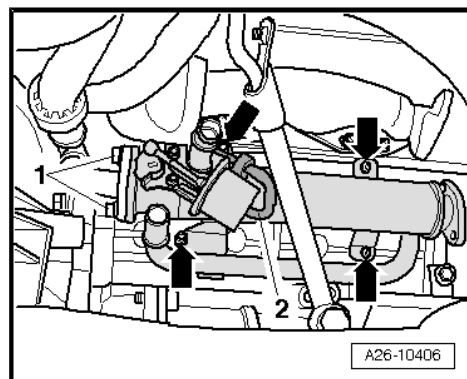
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- Pinch off the coolant feed hose and the coolant return hose for the radiator of the exhaust gas recirculation with hose clamps - MP7-602 (3094)- and detach the hoses -arrows-.
- Collect escaping coolant with the catch pan - VAS 6208- .
- Remove heat shield collar from vacuum setting element on the changeover flap.



- Release screws -1- for connection pipe for exhaust gas recirculation.
- Remove vacuum hose -2- from vacuum setting element and lay down.
- Release screws -arrows- and remove radiator for exhaust gas recirculation.



### Installing

Assembly is carried out in the reverse order. When installing, observe the following:

- ♦ Replace the gaskets, the sealing rings and the self-locking nuts.
- ♦ Secure all hose connections with corresponding hose clips.



### Caution

*When installing a new radiator for exhaust gas recirculation, replace all the coolant  
⇒ "1.3 Draining and filling coolant", page 163*

- Inspect coolant level, top up with coolant if necessary  
⇒ "1.3 Draining and filling coolant", page 163 .

### Tightening torques

- ♦ Radiator for exhaust gas recirculation  
⇒ "2.1 Summary of components - Exhaust gas recirculation with radiator", page 328
- ♦ Support for exhaust gas turbocharger  
⇒ "1.1 Summary of components - exhaust gas turbocharger with component parts", page 237

## 2.4 Check changeover of radiator for exhaust gas recirculation

### Special tools and workshop equipment required

- ♦ Hand vacuum pump , e.g. -VAS 6213-

### Work procedure



### Note

*The vacuum setting element for change-over flap is accessible from below.*

- Remove noise insulation ⇒ Body Work; Rep. gr. 50 .



- Unbolt heat shield for right drive shaft.
- Detach vacuum hose from vacuum setting element.
- Connect hand vacuum pump to vacuum setting element.
- Actuate the hand vacuum pump in order to generate negative pressure.
- The vacuum unit must open the change-over flap up to the stop at max. 0.08 MPa (0.8 bar) negative pressure and, in case of ventilation, must close it up to the stop -arrows-.

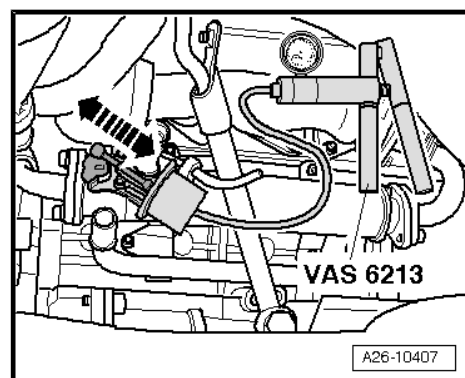


#### Note

- ◆ *For this test the opening of the change-over flap can be performed in jolts. In driving mode the change-over flap opens suddenly due to the "larger negative pressure volume".*
- ◆ *The closing of the change-over flap must be carried out suddenly when ventilating (e.g. detach vacuum hose).*

If the vacuum setting element does not open or close the change-over flap up to the stop:

- Replace radiator for exhaust gas recirculation with vacuum setting element  
⇒ ["2.3 Removing and installing radiator for exhaust gas recirculation", page 332](#) .



## 2.5 Test air-tightness of the radiator for exhaust gas recirculation



#### Note

*The radiator for exhaust gas recirculation generates a pressure of 0.05 MPa (0.5 bar) on the exhaust side. The pressure in this case is measured in the cooling system.*

Charge air system tester , e.g. -V.A.G 1687-

Adapter , e.g. -V.A.G 1687/11-

Adapter , e.g. -V.A.G 1687/15-

Adapter , e.g. -V.A.G 1687/16-

Y distributor , e.g. -VAS 691 005/1-

Adapter , e.g. -VAS 691 005/5-

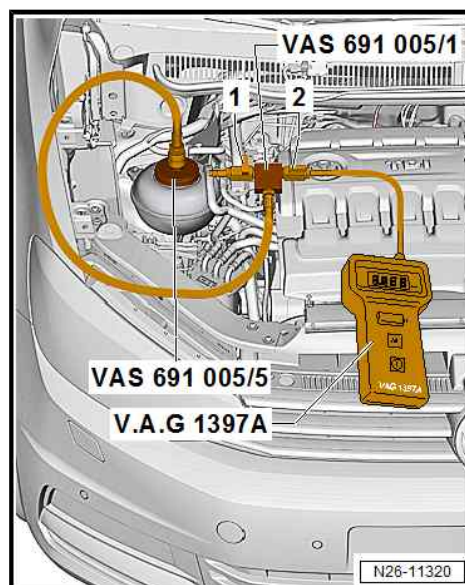
Turbocharger tester - V.A.G 1397A-

#### Conditions

- The coolant temperature must be at least 40 °C.

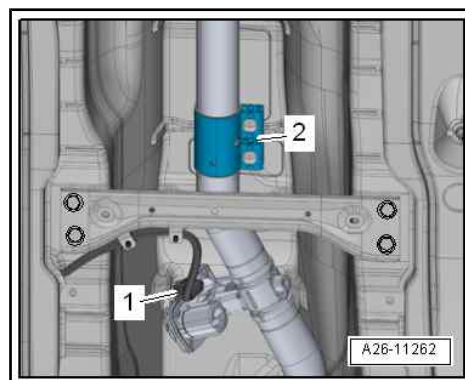
### Connect turbocharger tester - V.A.G 1397A-

- Screw the adapter - VAS 691 005/5- onto the coolant expansion reservoir.
- Mount Y distributor - VAS 691 005/1- onto the adapter - VAS 691 005/5- .
- Connect valve -1- of connection »C« and open valve -2- of connection »A«.
- Connect hose of the connection »A« Y distributor to connection »II« of the turbocharger tester - V.A.G 1397A- .
- Put turbocharger tester - V.A.G 1397A- in switch position »II« (measuring relative pressure) and switch on. The »II« must be visible

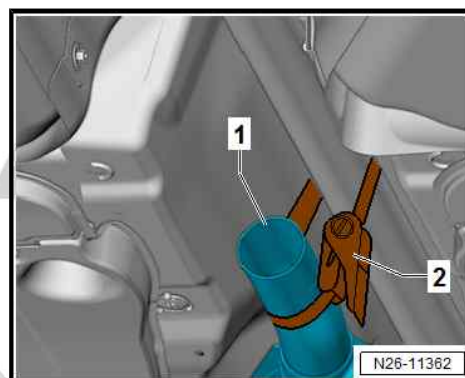


### Connect tester for charge air systems - V.A.G 1687-

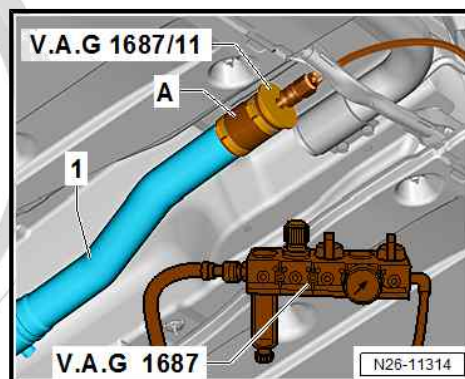
- If present, disconnect plug -1- from exhaust flap control unit.
- Loosen the clamping sleeve -2- on the exhaust pipe and slide it backwards.



- For vehicles without tunnel bridge, the exhaust pipe -1- must be attached at top with a securing strap -2-.

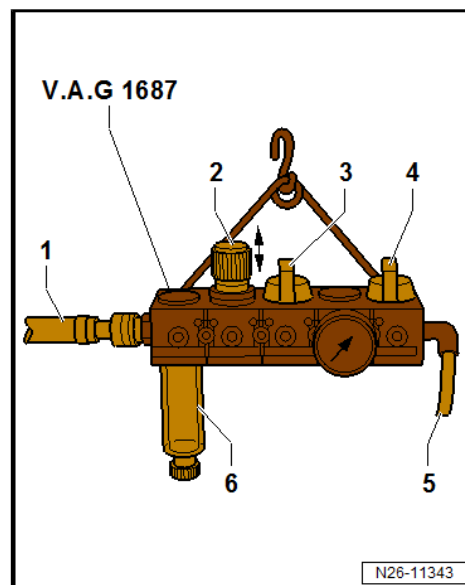


- Connect adapter - V.A.G 1687/11- with hose -A- to the exhaust pipe (on engine side). Secure hose with hose clamps.  
Use hose -A- for exhaust pipes with diameter of 55 mm adapter - V.A.G 1687/16- .  
Use hose -A- for exhaust pipes with diameter of 60 mm or 65 mm = adapter - V.A.G 1687/15- .
- Connect testing device for charge-air systems - V.A.G 1687- to adapter - V.A.G 1687/11- .



Prepare tester for charge air system - V.A.G 1687- as follows:

- Unscrew pressure control valve -2- fully and close the valves -3- and -4-.
- The rotary knob must be pulled to the top to be able to rotate the pressure regulating valve -2-.
- Connect testing device for charge-air systems - V.A.G 1687- to compressed air -1-.
- If there is water in the inspection glass, drain water via the drain plug -6-.

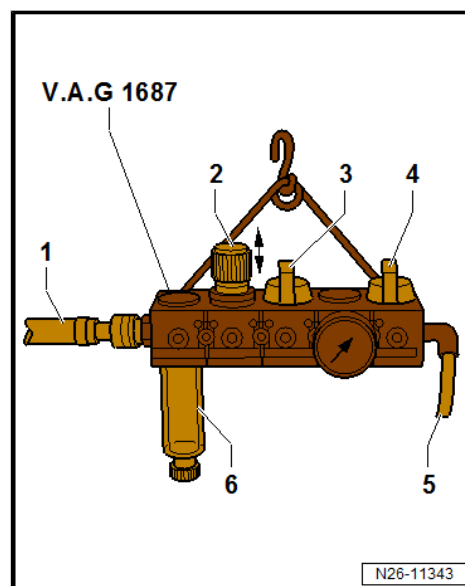


- Open valve -3-.
- Set the pressure to 0.05 MPa (0.5 bar) with the pressure control valve -2-.
- Open valve -4- and wait until the test circuit is filled. If necessary, re-adjust the pressure to 0.05 MPa (0.5 bar).



**Note**

*A small amount of air escapes via the valves into the engine. For this reason no pressure test is possible.*



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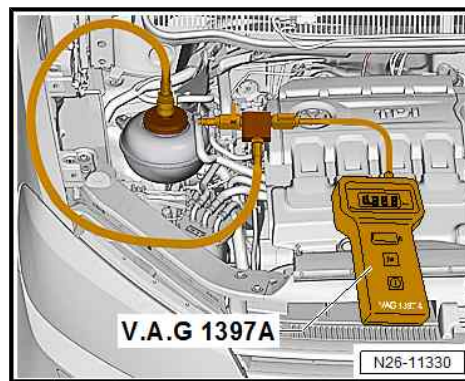
### Read off the turbocharger tester - V.A.G 1397A-

- Monitor the turbocharger tester for 5 minutes.
- The pressure displayed on the turbocharger tester must not increase!
- If the pressure shown on the turbocharger tester increases, compressed air is escaping into the cooling system on the exhaust side. Radiator for exhaust gas recirculation is not leak-tight. Replace radiator for exhaust gas recirculation.



#### Note

*Depending on cooling of the coolant, a vacuum may be generated when the radiator for exhaust gas recirculation is sealed. A vacuum is indicated on the turbocharger tester by a »minus« symbol.*



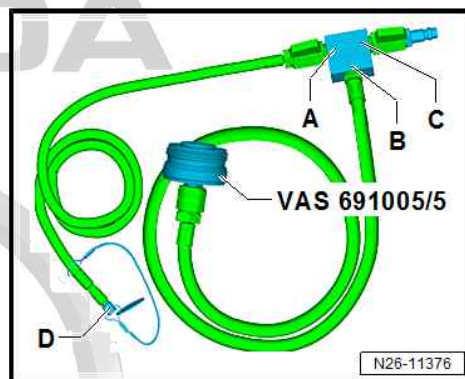
### Clean Y distributor - VAS 691 005/1-



#### Note

*After completing the leakage test, the Y distributor - VAS 691 005/1- must be cleaned to remove any moisture that has got in.*

- Insert washer jet -D- into the hose connection -A- of the Y distributor.
- Position test adapter - VAS 691 005/5- on the hose at connection -B-.
- Connect pressure hose to connection -C-.
- Open the shut-off tap and blow air through the hose for approx. 15 seconds.





## 28 – Glow plug system

### 1 Glow Plug System

⇒ [“1.1 Removing and installing glow plugs”, page 339](#)

#### 1.1 Removing and installing glow plugs



##### Note

*Metal glow plugs are installed in engines with identification characters CBBB, CBDB and CEGA.*

##### Special tools and workshop equipment required

- ◆ Flexible-head wrench SW 10 , e.g. -3220-
- ◆ Cleaning and degreasing agent , e.g. -D 009 401 04-
- ◆ Protective goggles and gloves

##### Removing

Observe all safety measures and notes for assembly work on the fuel system and on the injection system as well as the rules for cleanliness

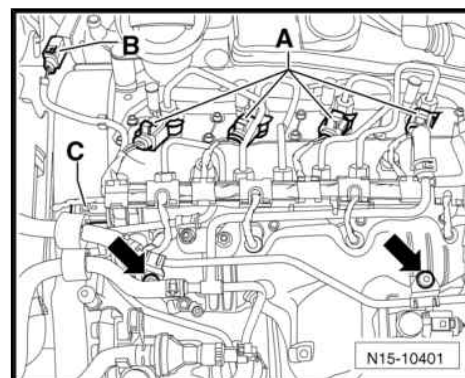
⇒ [“2 Self diagnosis, safety measures, cleanliness regulations and directions”, page 2](#) .

- Switch off ignition and pull out ignition key.
- Remove engine cover  
⇒ [“1.1 Removing and installing engine trim panel”, page 7](#) .
- If present, remove the noise insulation at the injection units.
- Disconnect the plugs at the injection units -A-, the exhaust gas pressure sensor 1 - G450- -B- and the fuel pressure sender - G247- -C-.
- Unscrew the fixing screws -arrows- of the coolant line from the intake manifold and lay the line in front of the intake manifold.
- Slacken the wiring loom from the wiring guide of the glow plugs.




##### Caution

- ◆ *Carefully disconnect the plug from the glow plugs.*
- ◆ *If the plug is damaged when disconnecting it, the complete wiring loom including the plugs must be replaced (plugs cannot be replaced separately).*





- 
- N23-10224

- 
- N15-10402



***Wear protective gloves and protective goggles when working with grease remover!***

- 
- N15-10404

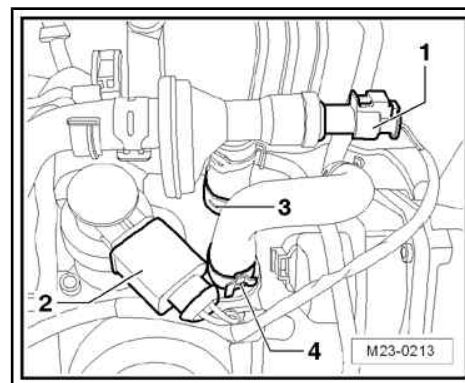


- Slacken spring strap clamp -4- and detach the fuel return-flow line from the high pressure pump.
- Seal the lines so that no dirt can get into the fuel system.
- Remove fuel return-flow lines and lay them in front of the intake manifold.
- Remove and place down cable guide.



#### WARNING

***Wear protective gloves and protective goggles when working with grease remover!***



- Clean bores for glow plugs in the cylinder head.



#### Note

*No dirt must get into the cylinder.*

When cleaning, for example:

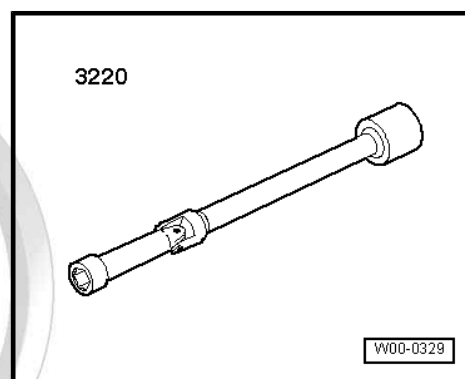
1. Suction off heavy dirt using a vacuum cleaner.
2. Spray the pencil type glow plug channel using a brake cleaner or a suitable cleaner, let it take effect for a short period of time and blow out with compressed air.
3. Then clean the pencil type glow plug channel with a cloth which is wetted with oil.

- Slacken the glow plug with a flexible-head wrench 10 - 3220- and release.

#### Installing

Installation is carried out in the reverse order; pay attention to the following points:

- Screw in the glow plug with a flexible-head wrench 10 - 3220- and tighten.
- Fit the plug again onto the relevant glow plugs and check for firm seating.
- Querying and erasing event memory of engine control unit  
⇒ Vehicle diagnostic tester.



#### Note

***After deleting the event memory of the engine control unit the readiness code must be checked and if necessary re-generated***  
⇒ ***Vehicle diagnostic tester.***

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#### Tightening torques

Component	Tightening torque
Glow plug	17 Nm